DEPARTMENT OF PRACTICAL ART.
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ADDRESSES

OF THE

SUPERINTENDENTS OF THE DEPARTMENT

PRACTICAL ART,

DELIVERED IN

THE THEATRE AT MARLBOROUGH HOUSE.

I. ON THE FACILITIES AFFORDED TO ALL CLASSES OF THE COMMUNITY FOR OBTAINING EDUCATION IN ART,

BY HENRY COLE, C.B.,

GENERAL SUPERINTENDENT.

24. Nov. 1852:

AND

II. ON THE METHODS EMPLOYED FOR IMPARTING EDUCATION IN ART TO ALL CLASSES,

BY RICHARD REDGRAVE, R.A.,

ART-SUPERINTENDENT,

27. Nov. 1852.

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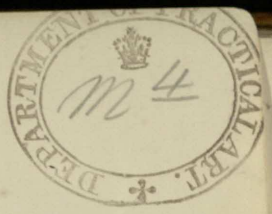

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AN

INTRODUCTORY LECTURE

ON THE

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OF

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TO ALL

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INTRODUCTORY LECTURE,

&c., &c.

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1. At an early stage of the organization of this department, Her Majesty's Minister who presides over it recommended that we should have no secrets in its management, and Mr. Henley's further advice, in his own words, was, "I recommend you to let the proceedings be such as may be placarded at Charing Cross!" So from time to time, as decisions laying the foundations for the future development of this department have been made by the Board of Trade, it has been my duty and wish to make the public acquainted with them. But the time has come, when these decisions should be shown to form parts of a system. And although the arrangements are still far from being complete, and the machinery is hardly in work, it has appeared right to embrace the first opportunity, which is now afforded by the commencement of the course of Public Lectures, to ask you to meet here, so that you may hear from us what we are attempting to do, and that we may learn from you your wants and wishes, with the view of perfecting the best course of mutual co-operation. For the essential well-being of this institution involves the distinct recognition of a partnership between the public and the institution itself. Accordingly, Mr. Redgrave and myself will

explain unreservedly the system upon which it is proposed to administer this new department. On this occasion it belongs to me, as General Superintendent, to describe the system by which we hope to afford to all classes of the community facilities for obtaining Art-Education; and at a future opportunity, Mr. Redgrave, as the Art-Superintendent, will explain the methods by which we consider that this object may be accomplished. His will be the educational, mine the business point of view.

General Principles of the Institution.

2. Before entering into details, some of the general principles governing our institution should be noticed; as important differences exist between it and most other public departments. The work to be done here is one, not merely for the public good in the abstract; but it is requisite that it should afford clear and tangible benefits to each individual of the community who chooses to participate in it. It is our duty to consult the interests of the individual, and our success rests almost wholly upon his approval. Our very existence as a department is dependent, just like the business of a merchant, upon the number of individuals or customers seeking what we have to offer. If we cannot induce the individuals of the community to seek and pay for the instruction we profess to afford, the fault and failure are ours alone. If the individual be ignorant, self-willed, prejudiced, and therefore will not seek our instruction, then I still feel that it is our duty, if we would succeed, never to relax any efforts to remove his ignorance, to direct his wilfulness in a right course, and to smooth away his prejudices. If we pitch the keys of our tuition too

high, we must lower them—remembering that the infant stumbles before it walks upright. If we cannot learn how to attract the public to our Museum, our Schools, and our Classes, then I say the fault is wholly our own, and not that of the public. It would be idle to attempt to prove that our system is theoretically right, whilst our rooms are empty of pupils; or to say that our system is a public success, whilst it fails to secure the sympathy of individuals. The individual as such, at the very outset, is an integral part of our institution; and we have to conduct operations in reference both to his weakness and strength, to his ignorance and wisdom. Hence you will admit the far-sightedness of Mr. Henley's remark, and the policy of making the public fully cognizant of all that we are doing. In fact, our first work is to endeavour to engage public attention to our proceedings,—to induce the public to listen to us; and I feel that the basis of our management should be complete publicity.

3. But there is another important difference between this and most other public departments. Here the Government, or corporate public, finds only a portion of the capital necessary for the expenses of this institution, whilst the public, in its individual capacity, finds the other portion.

4. It will be admitted to be sound political economy, that so far as individuals are willing and able to do their own work, it is undesirable that any Government should do it for them. It is only in accordance with immutable laws, and is now an admitted political axiom, that Corporate or Government work must necessarily be inferior in quality to the work of individuals. Corporations do

not pay the penalty of mistakes as individuals do; responsibility is divided, and in all corporate action that "unity and dispatch," which Sir Charles Trevelyan points out as "belonging to individual agency," are partially sacrificed. The late respected president of the Council, the Marquis of Lansdowne, said,—"Government must always be the worst of traders and the worst of cultivators;" and, I fear, he might have added, and the worst of educators. If the corporate public undertook the entire management of the Art-Education of the public, without the co-operation of the individual, I am bound to say that I should fear the result would not succeed. But this is not so, for here the public corporately and individually must combine.

5. The fact, that the Schools of Design have been, and that this department now is, supported chiefly by public funds, affords a proof, firstly, that there is a public feeling of the necessity of Art-Education; and, secondly, that the public, as individuals, are at present not willing, and, perhaps, not able, to conduct Art-Education themselves. If the public thoroughly felt that Art-Education was a want in each individual, they would soon supply the demand themselves, and do so better than any one could do it for them. But the public, at the present time, do not sufficiently feel this want; they only feel that, on the whole, it is right that some few thousands of pounds a year should be taken from their corporate purse for the object, —a sum not indeed sufficient to provide for the whole cost, but only to come in aid of it. And this arrangement at the present time, and in the present state of public intelligence, is, I conceive, the soundest that could be adopted. The time may come when

the public may be willing to obtain Art-Education, by their own voluntary arrangements, at its market value, and prefer that no charge should be made on the national purse. Meanwhile, we have to administer the mixed principle adopted in this department.

6. Viewed, therefore, in its pecuniary aspect, this system appears to me to afford a much surer guarantee for the future success of the department than if the whole funds were obtained from the public taxes. Indeed, as you must all feel that a merchant would never conduct a business successfully upon an unlimited capital in which he had no risk, so I think you will agree with me that neither this nor any other educational institution could succeed where the funds for its support were altogether independent of its own exertions — whether they result in success or failure. This is no theory: and if any public educational institutions are not as successful as they ought to be at the present time, it will be found that the payment of the management is too independent of the nature and quality of the management. Endeavours will be made gradually to render this institution more dependent for its support upon the voluntary than the involuntary contributions of the public. Such endeavours, however, cannot be reasonably expected to bear much fruit for some time, and all that can be fairly demanded at present of the department is, that the principle of self-support should never be forgotten in any of the details of our operations.

7. The work of Art-Education undertaken by this department must be regarded altogether as an experiment for a few years; not indeed without some compass to guide us, because the number of voluntary

contributors, who pay for the instruction they receive, will furnish the surest index of our progress.

Education of all Classes.

8. You are aware that this department has grown out of the School of Design, which was founded in 1837. During an existence of fourteen years some twenty branch schools in many of the most important seats of manufacturing industry have been established.* The School of Design had been founded expressly with the commercial object of improving the patterns of manufactures. It sought to do this by affording education in art to artizans only. From time to time attempts had been made, in various ways, to limit the education to that class of the community; but these attempts thus to circumscribe the action of the schools, arising upon a mistaken and imperfect view of the work to be done, did not succeed. Private classes, or classes consisting of students probably not artizans or designers, were noticed by Mr. Poynter, the late Inspector of the Schools of Design, in his last reports, as existing at Leeds;—at Manchester, where the admission of artists was stated to be "calculated to extend the influence of the school, and to identifying it with the arts in general in the public estimation;"—at Newcastle;—at Norwich, "the Grammar-school Class;"—at Notting-

* *Metropolitan Schools*, at Somerset House, with branch at Westminster; at 37. Gower Street, for female students only; and at Spitalfields.

Provincial Schools, at Belfast, Birmingham, Cork, Coventry, Dublin, Glasgow, Leeds, Limerick, Macclesfield, Manchester, Newcastle-upon-Tyne, Norwich, Nottingham, Paisley, Potteries (Staffordshire), Sheffield, Stourbridge, Worcester, York.

ham;—at Sheffield, "private classes beneficial to the school by increasing the number of its supporters;" —at Glasgow, "a life class principally attended by artists," which "tended to raise the importance of the schools;"—at Dublin, "where there was a considerable attendance of female students qualifying themselves as governesses with the purpose of going to America;"—at Belfast;—and at Cork, where there was a small private male class, three students being from Queen's College. These facts proved a desire on the part of the community generally to participate in the advantages of the schools, and that the limitation was wrong and ineffective.

9. The proposed object was the improvement of the artistic qualities of our manufactures; and the schools taught the artizan, so far as he could be induced to come to them after a weary day's labour. Many points needed solution before designs for manufactures could be improved by wearied artizans, fagging at elementary drawing on winter evenings. It might be asked, What part does the artizan act in the production of manufactures? and answered, Simply to perform, almost as a machine, what his employer directs him. Does his employer — the manufacturer — want the artizan's greater education in art? Are the manufacturer's commercial transactions hindered for want of the better art? Is he sensible of the want? Is he a competent judge of the better art if it were placed before him? As better art involves labour of a higher grade, and therefore increased cost, is he willing to embark increased capital in its production? Before we answer these questions, even others seem to claim precedence. Why are manufactures produced? Why are more

Cotton fabrics woven than Silk ones? Why are Woollens manufactured at one season and Cottons at another? Why does the manufacturer decorate fabrics for the South American market in one way, and the metropolis in another, making a difference even here between the West and East Ends? Why does he sell a Calico of one quality to Messrs. Hardings, or Swan and Edgar, and one of different quality to the retailer at Whitechapel? The one answer to all such questions is, simply because it is the will of the consumer. The manufacturer, if he would, has really no option about serving this consumer. He simply obeys his demand: if it be for gaudy trash, he supplies it; if, for subdued refinement, he will supply it too. The public, according to its ignorance or wit, indicate their wants, the manufacturer supplies them, and the artizan only does what the manufacturer bids him. The improvement of manufactures is therefore altogether dependent upon the public sense of the necessity of it, and the public ability to judge between what is good and bad in art. Years ago, as I have said already, it was determined that an improvement in the artistic features of manufactures was necessary, and was a proper national work to be undertaken by the Government; and, since the Exhibition of 1851, this view appears to have become strengthened. To give increased effect to this conviction, this department has been established. Our first and strongest point of faith is, that in order to improve manufactures, the earliest work is, to *elevate the Art-Education of the whole people*, and not merely to teach artizans, who are the servants of manufacturers, who themselves are the servants of the public. Our first object, therefore,

has been to devise means by which the department may promote all the several interests involved in the improvement of public taste. The interest of the public, as consumer and judge — the interest of the manufacturer, as the capitalist and producer — and the interests of the artizan, as the actual workman.

Elementary Education in Art. — Distribution of Examples and Models.

10. In an age of transition like the present — especially in this kingdom, where every one is free to hold his own opinions on all subjects, — politics, religion, taste, and everything else, — traditions are not respected unless they are upheld by the convictions of instinct and reason. And it is a national conviction, that the surest road to the formation of right opinions is through good education. General education, as the best means of making us religious and right-minded in morals and politics, is now fully admitted, although the system for affording it may be carried out imperfectly. Thinking men seem to be convinced, that an elevated public taste, like sound morals, is only to be obtained through education. At last we are beginning to be sceptical of the soundness of the old proverb, "Every one to his own taste," as though this taste were a property, where each one, whether wise or foolish, whether actually blind or having only eyes that cannot see, was free to settle the boundaries. We have still committees of taste consisting of men who cannot even draw straight lines, and are therefore unable to prove that they even see them, and they dictate to men who may have spent years in studying the principles and

practice of Art. The artist may be a very imperfect one, but surely he knows more than the man who never used a pencil. Still public intelligence is beginning slowly to admit that there is no royal road to a knowledge of Art, and that, like language, mathematics, or chemistry, Art must be learnt, and indeed can only be learnt, by slow degrees. The Government has now arrived at that conclusion, and has broadly affirmed the principle that elementary knowledge of form and colour shall become part of the national education: and this department is charged to carry this important principle into effect.

11. We are devising gradually a course of proceedings, by wnich we hope to enable all schools in the United Kingdom, even the most humble, to acquire this elementary knowledge; but it will be a long time before a system approaching to completeness can be matured. In the meantime, however, some little in a right direction can be done everywhere, as well in the school of a distant country village as in one in the metropolis.

12. Preserving the principle of a partnership and mutual action with the public, the Board of Trade has determined that every public school of an eleemosynary character shall be able to obtain a stock of drawing copies and models at half their cost price. We are collecting the best examples from all parts of the Continent. We are examining all systems, and without prejudice for any, endeavouring to form a catholic judgment upon what may be most deserving of recommendation. We have already prepared a list of objects which we do not hesitate to recommend. Gradually we shall be able to improve this list, but in the meantime there is something to act upon. Every

one, therefore, interested in the management of a public school may obtain the whole or any part of the objects in this list at half prime cost. For a single sovereign, we have already sent examples to poor village schools, managed by self-sacrificing clergymen, who act as the patriarchs of their parish on stipends of 100*l.* a year! We are preparing a manual to show how these models and examples may be used by teachers who have not learnt drawing.

We are organising a body of teachers who shall visit schools possessing these objects, and demonstrate to the *masters* and *mistresses* how to use them.* Our proceedings can only keep pace with the supply of qualified teachers; upon whom, it is obvious, that all effectual measures must depend. But we are not insensible to this want and are endeavouring to provide for it; and, we hope, from the several training schools, in connection with the Committee of Council for Education, to obtain a corps of masters who may be able to acquire the power of imparting elementary instruction in the principles of art, as they do in other branches of education, and yet may not be pre-eminent artists themselves.† A perception of the metaphysics of teaching is more important than the mere skilful practice of the thing to be taught. An expositor may be clear, although a clumsy manipulator. To teach children how to see straight and curved lines, to know a sphere from an oval, and to prove that they know it by drawing it; to show them

* Her Majesty's School in Windsor Park, for boys and girls, was the first where this system has been begun.

† A Class for teaching Masters meets at Marlborough House every Saturday, at two o'clock; and a Class for training Special Drawing Masters, at Somerset House daily.

how to perceive that most objects appear with light and shade, and that there are colours in the world which may be artificially brought together well or ill, according to certain laws, only ordinary intelligence is required. It is not imperative that every one should be an incipient Raffaelle to teach these things.

13. We feel that it is more important to the end in view, to have elementary knowledge of form and colour imparted in all schools, beginning even with infant schools, than in generating at once special schools for the purpose.

14. Next to reading, and in some cases before writing, a correct appreciation of form, and power to delineate it, is necessary. A sense of correct form is indispensable to the artizans, — carpenters, masons, bricklayers, smiths, sempstresses, &c. — who spend their lives in trying to realise it in material substances; and not less indispensable to the purchaser, and therefore critic, of their works.

15. The limit to which our distribution of examples will go depends upon the desire of the public to avail themselves of the facilities offered, and, next, upon the means which Parliament may place at our disposal for this purpose. We are inadequately organised to enter upon very extended operations at present, but demands are beginning to press upon the department, which show a public eagerness to use the facilities offered. If we are able to convince Parliament that some hundreds of public schools desire to teach the elements of Art-Education, it may be confidently hoped that an appeal for funds will not be made in vain. In fact, parliamentary grants made for this object are but the profitable investment of national capital — a loan to be repaid a hundredfold. For

every thousand pounds voted, we shall get back five hundred at once, whilst the remaining five hundred are laying foundations for an increased demand both at home and abroad for skilled and therefore well-remunerated labour.

17. At present the aid in respect of examples will be limited to eleemosynary public schools and institutions; but the effect of the proposed system is already showing itself elsewhere; and unless the symptoms are misleading, it will not be long before the great public institutions for the education of the upper and middle classes will seek to possess the examples we recommend, and make the teaching of form and colour part of their course of education. Having such men as Dr. Hawtrey at Eton, Mr. Liddell at Westminster, and others whom I might name, it is not likely that they will be satisfied that the schools they direct shall be lower in the scale of education than the national schools in their immediate neighbourhood.

18. Where a locality has a sufficient number of schools to justify the appointment of a master to visit each school in rotation, and is willing to pay at the rate of 5*l.* a year for each school for a lesson to be given once a week, there we shall appoint a competent master as soon as we have trained him; and we have already commenced this system at the National Society's School in the Sanctuary, Westminster, and at a large school for adults and children near the Charterhouse, conducted by the Rev. W. Rogers, and numbering several hundred students.

Distinct Schools for Elementary Art.

19. By imparting a knowledge of form and colour in all schools, and to all scholars — both boys and

girls—those whose faculties are most apt to acquire and demonstrate such knowledge will soon form special classes for carrying the practice of Art beyond the mere elements. And naturally in each locality, as the want is felt, a distinct school to prosecute the practice of Art may be expected to be created. And this mode of proceeding appears the surest way of laying the foundations of such schools; far surer than by beginning with the establishment of a school on the chance of a constituency, to whom the first elements of knowledge have to be given. Here supply will naturally follow demand instead of preceding it. When a neighbourhood is sensible of this want, and makes its desire known to this department, we shall endeavour to be ready to aid. On the same principle as before, we are willing to go half way in providing assistance. We will provide a collection of casts and models at half the cost; we will recommend a qualified teacher, and guarantee a certain income to him for a limited period, until the school becomes self-supporting, which in time it ought certainly to do. If not self-supporting by its own merits, then it ought to be dependent wholly upon funds collected in the locality, and not upon the national exchequer.*

20. These schools of general Art thus naturally arising out of a sense of their necessity and value, will be frequented, it is to be hoped, by all classes, and may probably become connected with local museums and libraries. In them the rule will no

* Schools on these principles have already been established at Waterford and Chester, and are in progress of formation at Hereford, Burslem, Swansea, Dudley, Birkenhead, and many other places.

doubt prevail that education in Art will be general rather than specific; but it may be foreseen, that a specific kind of instruction may become necessary in some. Such places as Canterbury, and Bath, and York, and Colchester, will probably have their school of general Art, whilst Swansea, the seat of potteries and smelting, — Truro, of mining machinery, — Liverpool, of ship-building, — and Bristol, of glass and machinery, — may find it expedient to have the general school with some instruction added to it applicable to their local specialities. But I am rather glancing at the future than dealing with the present.

Advanced Schools for technical Art-Education.

21. The schools hitherto called "Schools of Design," founded and maintained chiefly by the Government, can be regarded at present only as Schools of General Art, where a precise course of general education in Art is followed and administered at a very low rate of payment. At Somerset House, and at all the provincial schools, the student learns geometrical drawing and perspective, together with an admirable system of free hand drawing, instituted by Mr. Dyce, who laid the foundations of the best part of the present system of instruction. The student then proceeds to copy, in chalk drawing and painting, works of the greatest excellence of all periods of art. At most of the schools he is taught to paint from natural objects, — flowers, fruit, animals, &c.; and he is surrounded by examples of art calculated to excite his emulation. The schools are open all day and every evening, except Saturdays. Scholarships, from 10*l.* to 30*l.* a-year, are now established for competition,

among the students of all the schools. For these advantages he contributes at present in return only at the rate of about five farthings a lesson of three hours! I confess I think this payment, as applied to all classes of the community, is far too low, and that it has been an impediment to the progress of the schools. No one values what may be had for nothing, especially those who can afford to pay. I believe the Art education to be obtained at Somerset House is, on the whole, the most complete and systematic in the metropolis at the present time and it costs sixpence a week. This school is numerously frequented by artizans in the evenings, but I hope to see it attended more fully in the day time, and chiefly by the middle classes. Before this can take place, two things must happen; elementary education must be universal, in order to foster a more general desire to obtain the advanced instruction, and the fees must be largely raised to make the instruction properly appreciated. All experience proves that a commensurate payment whilst it is necessary, is also practicable. At the present time, the School of Art, recently established at Waterford, on a better system, is the most self-supporting public school in the United Kingdom.

22. The tendency of the Art education in the principal of these schools will be to become special and precise. As the respective localities which now have schools of Art become sensible of the necessity of a special Art-Education, the instruction given in the schools will become specific in character, and there is no doubt that it will require to be not only artistic, but scientific. They will become schools of Art and Science, and not remain for Art merely. But before

they can become so, they must make their value felt and acknowledged by all classes in their neighbourhood. The manufacturer must feel that these schools are able to afford knowledge useful to his children, and he must be led to support them, not for charity's sake and an affectation of promoting the arts, but because they are indispensable to his own progress. When a calico printer feels that his son, a future partner in his firm, is disgraced at being far below in knowledge of Art the artizan whom he assumes to direct, then he will send his son to the School of Art, and pay adequately for his instruction ; but so long as the school is organised chiefly for the artizan class, and the rich manufacturer supports it as a charity, and with that pride which apes humility, he will not send his children there. Gradually, however, the eleemosynary system is changing for a self-supporting one, and it has been and will continue to be the effort of this department to convince the local committees of the necessity of this change. Unless they are content that their rich localities shall remain State pensioners for Art-Education, and falsify all their professions of desire for local independence, they will rouse themselves to make Art-Education self-supporting.

Special Classes for Technical Education at Marlborough House.

23. Having told you of the foundations which are being laid to make elementary education in Art a part of national education, and having noticed the present state of the schools of Art already in operation, I have next to explain the measures which have been taken to give that technical instruction which,

indeed, was the express object in view when the schools of design were founded. In 1835 a Select Committee of the House of Commons was appointed to "inquire into the best means of extending a knowledge of the Arts and of the principles of Design among the people (especially the manufacturing population) of the country;" and it recommended the formation of an institution, where "not theoretical instruction only, but the direct practical application of the Arts to manufactures ought to be deemed an essential element." The School of Design was accordingly established in 1837. The several reports of the Council or Committee of Management show that the object for which it was founded has been always borne steadily in mind. In 1836 the Council stated, "the object of the proposed school is to afford the manufacturers an opportunity of acquiring a competent knowledge of the Fine Arts, as far as the same are connected with manufactures." In 1842 classes were proposed to be formed, for "the study of the various processes of manufacture and the practice of design for individual branches of industry;" and in 1843 the Council declared that "though the school, to a certain extent, occupied common ground with ordinary drawing schools, it had beyond this a specific purpose, from which, in fact, it derives its name;" adding that "the acquisition of skill in drawing is only a preliminary step to the real business of the school, which is to teach the art of designing ornament, both in respect of its general principles and its specific application to manufacture." And Mr. Dyce, the then director of the school, instituted one or more special classes for learning the practice of design. Designs for manufactures were made, and

among them that for the Honiton lace which decorated Her Majesty's bridal dress, made, I believe, by Mr. Hudson, then a pupil of Mr. Dyce's, and now our Professor of Woven Fabrics. But these practical operations seem to have been arrested, and the course of instruction altered. Still the professed object, although not practically carried out, continued to be remembered. In 1847 the Council repeated, that it was their "endeavour to devise and carry into effect a systematic and complete course of instruction, which should embrace the theory and principles of ornamental design (including the history and explanation of the different styles), and the application of those principles to the various kinds of manufacture, to the end that the power of making original designs may be acquired by the pupil, and may be exercised by him whilst in the school."

24. In 1849, another Committee of the House of Commons reviewed the subject, and affirmed the national importance of the School, commercially and morally. Changes in the management were suggested, which were probably delayed by the advent of the Great Exhibition. But in February of the present year, just before Lord John Russell's Ministry retired, the Department of Practical Art was formed in order to endeavour to carry out more completely, and to give practical effect to the views which had always been held.

25. We have accordingly commenced operations in these walls; and for the means of doing so, I venture to say that public gratitude is due to the personal interference of His Royal Highness Prince Albert, the foremost, uniform, and consistent, though oftentimes unknown, advocate of the better education

of all classes of the people. He represented to Her Majesty how the School of Design had always been paralysed in its development for want of space, and that without it, this Department would have but little chance of success; and the Queen was most graciously pleased to grant the temporary use of Marlborough House for an extended experiment of affording technical Art-Education. Upwards of forty rooms in this house, the first stone of which was laid by Sarah Duchess of Marlborough, in 1709, occupied about a century afterwards by the Princess Charlotte, and lastly by the pious, gentle, and patient lady, Queen Adelaide, are now appropriated to the purposes of the Department. The ground floor is used to exhibit the Vernon Pictures. The second and third floors and basement are occupied by this Department. The upper bedrooms are converted into special class rooms for technical instruction; the lower bedrooms serve the purposes of the Museum; the cellars, pantries, still rooms, &c. are filled with casts of ornament; and the kitchen is now this lecture room, where ladies are sitting on the grid-irons, whilst lecturers venture to criticise the taste of garments which they wear.

26. Already our operations are impeded for want of room. Fifteen hundred casts of ornament lie buried in the cellars. The rooms for the special classes are too small and not well lighted. We have not half the space we already want for exhibiting. Still we have reason to be most grateful for the accommodation we have, as it will enable us to show whether the Department may not become worthy of better and more suitable premises.

27. The special classes formed at Marlborough

House, and now in operation, are for teaching the following technicalities — Artistic Anatomy, Practical Construction, Wood engraving for ladies only, Porcelain painting, decoration of Woven Fabrics and flat surfaces generally, and the ornamental treatment of Metals. All these classes meet in the day, and those for Anatomy and Practical Construction meet in the evening also. Students who have passed through the course of instruction at Somerset House and the branch schools, and have acquired an adequate power of drawing and painting, are admitted at a lower rate of payment than those who have not been at the schools, and do not bring such a guarantee of their competency.

The study of *Artistic Anatomy* includes Drawing, Painting, and Modelling all kinds of Zoological Figures. The studies are conducted in the following groups: Drawing in Chalk or Charcoal with a view to the correct study of structure through light and shadow. The study of the antique and of Nature is therefore prosecuted, in careful comparison with the bony and muscular frame-work, from casts, prints, &c. 2. Modelling in Clay and in Wax. In this group the principles of *Relievo* are taught, and the study from the round, whether of original figures or from fine examples, is carried on with constant reference to the test of anatomy. 3. The Painting group comprehends the various methods of Painting in Water-Colour, Tempera, Oil, or Fresco; commencing with Monochrome Painting from plaster casts, and advancing to the study of coloured examples, with occasional reference to the living model. Demonstrations are given by the Professor, from time to time, reviewing the chief points in the human frame, or in

the structure of animals, which are of interest to the ornamental designer, painter, or modeller, with illustrations from the surrounding examples in the studio or museum. Students from any of the schools of Ornamental Art, desiring to enter these classes, are required to submit specimens of their ability, sufficient to indicate the previous acquisition of a power to draw, paint, or model. On producing a certificate of having passed through the first six stages in the course of instruction of those schools, they are admitted on payment of a fee of 3*s.* per month. All other students properly qualified are admitted on the payment of a fee of 7*s.* per month.

In the class for *Architectural Details* and *Practical Construction*, instruction is given in Linear Drawing and the use of Geometric Instruments, in connexion with the following studies: — 1. Practical Geometry and Geometric Construction, applied to Carpentry, Joiners' Work, Masons' Work, Plastering and the various branches of Constructive Architecture; Upholstery, and Interior Decoration. 2. Architectural Details, as, Architraves, Doors, Mouldings, Panels, Pilasters, Soffits, &c.; and the preparation of Working Drawings of the various members of Architectural Construction. 3. Ichnography, or the science of Planning; Skiography, or the Projection of Shadows; and Plain and Isometrical Perspective applied to the same purposes. Students possessing a certificate of having passed through the five first stages in the course of instruction of those schools, are admitted on the payment of a fee of 3*s.* per month for the evening, and 6*s.* for the morning. All other students are admitted on the payment of a fee of 5*s.* per month for the evening, and 10*s.* per month for the morning.

A class is formed for practising the various Processes of *Casting* and *Moulding*, open at present to male students only. The object is to teach the students of the Modelling Classes of the Department the processes of making Waste Moulds, Piece Moulds, Elastic Moulds, and the uses of Plaster of Paris, of Wax, and of Gelatine.

The class for female students only, in the practice of *Engraving on Wood*, has existed for some years. The instruction consists in the practice of Drawing on Wood, Engraving on Wood, and preparations for printing Wood Blocks. Students are not admissible to this class until they have acquired the power of drawing from the round. They who produce a certificate of having passed satisfactorily through the six first, the tenth, and fourteenth stages of the course of instruction, are admitted on payment of a fee of 30*s.* per quarter, or 5*l.* a year, paid in advance. All other persons are admitted on payment of 50*s.* per quarter, or 8*l.* a year, paid in advance. Some considerable changes have been lately made in this class. The hours of attendance have been increased from four hours to about thirty hours per week. The fees have been raised from 2*s.* to 10*s.* a month, and the result thus far is, that the pupils have increased one-third in number.

Class for Painting on Porcelain.—You will see in the Museum some modern paintings on Porcelain, executed in Bavaria, and lent by Prince Albert for our instruction. One is an admirable copy of Sir Edwin Landseer's picture of one of the royal children in a cradle. Excluding one or two painters in Enamel on Metals in the Metropolis, it is hardly too much to say, that we have no artists who are able

to make such a copy at the present time on Porcelain; not for want of artistic ability, but of practice in the technicality. We are making the experiment of training Artists to do this, and there are symptoms that we shall succeed. As English tourists buy such works in their travels, it appears reasonable to expect they will buy them at home. And if there be a market, we will furnish students to enable manufacturers to supply it. In this class, instruction is given in the processes, and in the actual practice, of Painting on Porcelain; and the student has the opportunity of seeing the work fired in the kiln. The students have the privilege of making copies from celebrated Pictures by the Old Masters from Hampton Court, &c., and by various eminent artists, as well as of the finest examples of various styles of Painting on Porcelain. Separate classes for male and female students meet at Marlborough House daily. Students cannot enter for a course of a shorter period than two sessions, for which the fees are 5*l.*; students who enter for a whole year are to pay 8*l.* No student is permitted to enter this class who is unable to afford proof of satisfactory proficiency in Drawing and Painting, which all students will be required to give.

I have now to notice the two special classes formed especially with reference to manufactures, properly so called. One is for *Woven Fabrics* of all kinds, including *Embroidery*, *Lace*, and *Paper Staining*; the other for the practice of Ornamental Art applied to *Metals*, *Jewellery*, and *Enamels*. In both these classes, arrangements are made to afford the manufacturer, student, designer, and workmen all the advice and assistance which the Pro-

fessor may possess in improving Art applied to these manufactures. Manufacturers, designers, &c. may consult the Professors on the execution of any works or designs originated by them, or obtain information as respects the examples in the Museum, or books, prints, &c., in the Library; also as respects the fitness of students of the Department to become designers, or Art workmen, &c. If unable to attend personally they may send their works to receive the benefit of the Professor's suggestions, paying the necessary postage or carriage of the same to and from Marlborough House, and transmitting the appointed fees. The fees are as follows: — Daily students (who are required to demonstrate that they possess an adequate power of drawing and painting before they are permitted to enter the class), 50*s.* a quarter, or 8*l.* a year. Manufacturers, designers, or others, seeking occasional advice, 6*s.* a week, or 2*s.* each separate consultation. Manufacturers and others may subscribe annually 5*l.*, may attend themselves, or send their workmen, at any time to receive advice and assistance in originating or executing Ornamental Designs.

28. It would be presumptuous, as yet, to prophesy what these special classes may be able to do. The production of the funeral car of the Duke of Wellington is, however, the first public result of them. Whatever may be its merits or defects, I may say that the car would not have been produced, if our special classes here had not existed. We were asked by the Lord Chamberlain to suggest a design for a triumphal car and superintend its execution. Although imperfectly organised, we thought it our duty not to shrink from the work. We had just three

weeks to produce a work which would reasonably occupy a whole year. So great was the pressure at last, that for eighty hours preceding the starting of the car, the workmen of two bronze foundries had not had their clothes off their backs; and up to the very dawn of the day some fifty female students of the school were at work on the embroideries. The briefness of the time placed great restrictions on the character of the design, not forgetting the lowness of the archway at Temple Bar. We resolved to make the Duke's coffin the principal object; and in this we succeeded, for I believe every one of the hundreds of thousands of mourning spectators would point to that coffin as the object best impressed in his memory. We resolved whatever there was should be real, and not a sham; but were defeated in this by the disobedience of two of the manufacturers entrusted with the castings. Helmets had to be fitted in particular spaces; one had been modelled and was sent to Birmingham to be repeated six times in bronze. Would you believe it! the manufacturer had the irreverent audacity to put aside the model altogether, and to substitute a helmet different in shape, and so big that it could not be used. We sent to another manufacturer a lion's head of a particular model: he returned it a sort of pug dog's head, too large. Such is the wilful ignorance of Art and moral disrespect for authority among some manufacturers displayed at a moment so critical; and thus we were driven to affix painted papier maché helmets: but these were the only shams. On the other hand, I must notice an act of graceful homage to reality, as it seems to me, on the part of Garter King of Arms.

Before seeing our embroideries the Duke's tabard or surcoat had been painted with its heraldry, but after seeing them it was cancelled and our female students requested to substitute a real embroidered one. The general design of the car was chiefly suggested by Mr. Redgrave, but the successful realisation of the structure, with its ornamental details, was due to the ability of Professor Semper, who conducts our Metal class, whilst the richness and propriety and truthfulness of the Woven Fabric decorations resulted from the superintendence of Mr. Octavius Hudson, who has charge of the class for Woven Fabrics. Although the car was essentially a reality in its materials, it was perhaps less a reality viewed on true æsthetic principles than a simple bier borne by soldiers would have been, and less impressive than the Duke's horse with the dangling empty boots. Truth in effect must arise from the perfect reality of all the attendant circumstances. Triumphal cars belong to a past age — the artilleryman's gun carriage or the soldiers themselves carry their comrade to the grave, in these days.

The Library.

29. Upon this division of the Department, I will read a brief account of its present state from a report of the newly appointed librarian, Mr. Wornum: He says, "The Library is now available to the students and the public in general, and is already sufficiently advanced to be of great use to all those concerned in ornamental manufactures. This Library was commenced some years ago as constituting a necessary element towards the complete education of

the designer and decorator, the original funds being a portion of the parliamentary grant of 10,000*l.* voted for the general outfit of the Schools of Design." "The increase of the Library of late years has, however, been in abeyance, not only from a want of any considerable special fund, but absolutely from a want of space to deposit the books when purchased, so as to make them available to the student. The books have hitherto been consulted with the utmost inconvenience through the great want of a special room devoted to them." This defect is now remedied: three rooms in Marlborough House have been set apart for the service of the Library. The nature and object of the Library are that it should be one of Reference for manufactures, and all matters illustrating the progress of Ornamental Art or the development of Taste, in relation to the beautiful; and it meets this object to some extent, but yet requires large additions, in every department, before it will have attained that completeness implied in the efficient service of the object of its formation.— "In some departments the collection is already in an advanced state, in others it is still far from even an approximation to what is required. In architecture, sculpture, painted glass, general antiquities, decoration, and in most classes of a general character, it is much more advanced than in the special. If possible it would be very advisable to form a good collection of monographs on the various trades, showing either the history or the technicalities of such trades."

On the subject of the Classed Catalogues, Mr. Wornum says, "In order to render the Library as useful as possible to manufacturers and students, I pro-

pose, as soon as possible, to prepare a Classed Catalogue, in which the character of the book shall be briefly explained; but the first step to this catalogue will be a simple list of titles, alphabetically arranged; the titles of foreign books will be translated, and in all cases as much of the titles given as is necessary to show what the book contains."

"It is proposed to make the same classification of prints and drawings as of books, that is, according to their subjects."

The Museum of Manufactures and Casts of Ornament.

30. I have laid stress on the imperative necessity of educating all classes, if we would improve the national taste. We cannot expect grown-up men and women to go to schools to learn the elements of form and colour; but the museum and lectures may become their teachers, and even thus early we have found out that they are willing to become pupils. In fourteen weeks upwards of 27,000 persons have visited the Museum which we have begun to form, and of these as many as 2174 have paid as students in about ten weeks. We open the Museum to the public generally on Mondays and Tuesdays, but reserve the Wednesdays, Thursdays, and Fridays for the purposes of study. And we exact a fee of sixpence as the test that the visitor really comes for study, and desires to have the quiet necessary for prosecuting it. On these days every one is free to make any drawings of objects in the Museum without additional fee, but if he wishes the object to be removed from its case or stand and

actually to handle it, then another fee of sixpence is exacted, and we require the applicant to wash his hands. The registered paying students of the Department, numbering about five hundred, are admitted without further fee. These arrangements are only experimental, but we have reason to believe they are welcome to all parties. Moreover the fee preserves the self-supporting principle of the Institution, and even thus early yields an income which pays the cost of the custodyship of the Museum. Although there are articles of great value,—several of the specimens of Sèvres porcelain, lent by Her Majesty, exceeding the value of a thousand pounds each,—and many others unprotected by cases, we have not had a single accident from the thousands of visitors, who at once seem to have become sensible that we placed full confidence in them.

31. As the objects of the Museum embrace articles of utility, involving decoration or perfection of make, extending over all times and belonging to all nations, of course this Museum must be regarded only as a very modest beginning, and its growth must depend upon the public appreciation of its value and utility. To enable us to obtain the best advice in our purchases, a rule has been established by the Board of Trade, that, as far as practicable, all objects proposed to be bought shall be exhibited publicly in the Museum beforehand. Until some different arrangements are adopted in the management of our public museums, there are several portions of this Museum that obviously must remain imperfect. It would be a waste of public money, that we should purchase Etruscan vases or ancient bronzes, whilst the public possess them in abundance in the British Museum,

or that we should buy specimens of ancient British pottery, whilst the Museum of Practical Geology is rich in them. Probably the time is not very distant when the public will consider it most logical, economical, and convenient, to have all similar articles in one place. At the present moment, the Trustees of the British Museum, and the Board of Trade, are both buyers of majolica for public study. One great result of a concentration would be, that an extended public use might be made of the specimens.

32. In this Institution the principle has been adopted by which provincial Schools of Art, in connection with it, may have the privilege of purchasing, at half the prime cost, any duplicates or excess of quantity of articles that may be superfluous here. By this arrangement every large town in the country becomes interested in the perfection and extension of the Central Institution, and the principle of centralisation becomes tempered with a proper complement of its antagonistic principle of dispersion.

33. A further illustration of the great advantages of mutual co-operation with the public, the necessity of which I pointed out at the beginning, is shown by the valuable loans we are entrusted with. And thus our Museum, although necessarily poor at present in its own possessions, is made the trustee of some of the finest works in the world. Except at Versailles, when Louis XIV. was showman and salesman to his nobility of the porcelain produced at his royal manufactory at Sèvres, I believe such a collection of Sèvres vases has never been brought together as that now benevolently lent by Her Majesty, and to be seen in our pottery-room. When we remember the exclusiveness of past sovereigns, this act of the

Queen's, by which Her Majesty suffers her own chambers and cabinets to be stripped of their gems in order that the working man from Stafford and Worcester, who paints flowers or models, may be enabled to examine and even handle them for his own instruction, has, to my mind, something touching, elevated, and spiritual in it, and is far beyond any act of mere royal condescension. If our Museum hereafter engage public sympathy, the personal aid which Her Majesty and Prince Albert have afforded to it will be among the chief causes of success. We are indebted also for presents or loans of objects to Lord Granville, Mr. T. Baring, Mr. Henry Byng, Mr. Farrar, Mr. Field, Mrs. Henley, Mr. Minton, Admiral Sharpe, Mr. Tupper, Mr. Webb, and others. And I must not fail to remark, that the important step of inducing the Government to purchase articles from the Great Exhibition to the extent of 5000*l.* was taken by that nobleman who, in his administration of the Exhibition, won golden opinions of all connected with it — Lord Granville.

34. From what has been already said, you will see that the Museum is intended to be used, and to the utmost extent consistent with the preservation of the articles; and not only used physically, but to be talked about and lectured upon. For my own part, I venture to think that unless museums and galleries are made subservient to purposes of education, they dwindle into very sleepy and useless institutions. I am happy to announce that we have received promises of assistance in the courses of lectures proposed to be delivered in this Institution, from Dr. Lindley, Dr. Playfair, Professor Forbes, Mr. Owen

Jones, and others most competent to afford the instruction desired.

Conclusion.

35. Before I conclude, I feel it incumbent on me to express, on behalf of my colleague, Mr. Redgrave, and myself, our sense of the great aid which this Institution, thus at its starting, has received from Mr. Henley, the president of the Board of Trade. Mr. Henley, when he came into office, found this Department just created by his predecessor, Mr. Labouchere. Mr. Henley had never professed any special attention to Art and Manufactures; but he entered at once into the examination of the past history of the whole subject and its political bearings on the welfare of the community. He has investigated, with scrupulous patience and caution, every detail of the administration submitted to him, detecting instantly, with instinctive shrewdness, any lurking fallacy or weakness. He has accepted, with frank and unhesitating liberality, every suggestion for enabling all classes of the community to participate in the advantages of the Institution. And I will not refrain from adding, that if we succeed in making a knowledge of Art a part of the education so far as it is afforded to the whole people, and in assisting the country to establish local museums of Art, the thanks of all will be due to the present President of the Board of Trade.

36. The facilities afforded by this Department to all classes of the community for acquiring education in Art, may thus be summed up. As far as practicable, on self-supporting principles, we shall endeavour to encourage and assist, but not supersede, all

local efforts to introduce education in the elements of form and colour in schools of ALL kinds, and for all grades of society, — to promote the establishment of special schools for the practice of advanced studies,— to afford instruction in the specialties of Manufacture so far as they regulate the nature of the Art to be applied; and, lastly, to establish a central Museum, with its branch local Museums of Art and Manufactures, applicable to direct instruction. In all these various objects, the principle will be to give assistance half-way, but no further. We shall submit all our proceedings to the test of the fullest publicity — we shall court suggestions and invite criticism; when we make mistakes we will endeavour to correct them. Our work is a fight against national ignorance in Art, to be won by persuasion and reason: and we shall win it if we are able; if unable, we can only promise that the fault shall not be laid to our want of perseverance, watchfulness, or patience.

AN

INTRODUCTORY ADDRESS

ON THE

METHODS ADOPTED BY THE DEPARTMENT

OF

PRACTICAL ART,

TO

IMPART INSTRUCTION IN ART TO ALL CLASSES OF THE COMMUNITY.

BY RICHARD REDGRAVE, R.A.,
THE ART-SUPERINTENDENT.

INTRODUCTORY ADDRESS,

&c., &c.

On Wednesday last you were addressed from this place on the extended field of usefulness undertaken by this department of Practical Art, on the educational advantages it offers, and the instruction it affords to the public generally, as well as specially to the designer, the artizan, and the manufacturer. It is now my duty to endeavour to explain to you the nature of that instruction, and the methods which it has been thought advisable, after full consideration, to adopt in order to impart it.

The instruction heretofore offered in Schools of Design was intended to train designers, by whose skill our manufactures (allowed to be excellent in staple, in fabric, and in workmanship, although defective in design) might be decoratively improved, and to qualify artizans to execute with knowledge and understanding the improved designs resulting from such teaching.

You have already been told why this sphere of action has been enlarged; and that it has been thought necessary to educate the PUBLIC generally, not only to prepare them to appreciate such improved

works when executed, but because a knowledge of drawing is a valuable auxiliary in most trades, a means of training the perceptive faculties, and a useful aid in many of the ordinary duties of life: and I now enter upon my section of this subject, which divides itself under THREE general heads.

I°. The method adopted to give instruction to all in drawing, &c., as an improvement of the perceptive powers and the appreciative taste; with the collateral advantage of imparting at the same time a language of explanation between employer and workman.

II°. The more peculiar instruction which it is our office to impart in ornamental decoration, both as to power of execution, knowledge of styles, and proper application of ornament to different fabrics and manufactures; and this equally for the education of the art-workman, the training of the future designer, and the improvement of the public at large.

III°. And, lastly, the methods adopted in those classes which the department has provided for instructing the art-workman and the designer in their *special* branches of industry. In which classes, not only the principles which regulate the just application of design to the special fabric or manufacture are taught; but all those *processes*, whether of the hand, the machine, or the laboratory, which govern its production, are explained to the student by professors qualified for such specialties.

I°. *Elementary Drawing.*

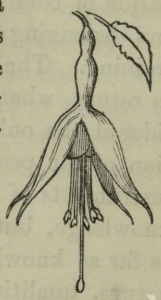
First, then, as to the methods adopted to give instruction in drawing to all classes, which I may

perhaps be allowed to preface with a few remarks as to its general necessity to all persons and all classes. Instruction in the knowledge of *forms* and in the power of expressing or repeating images of those forms, whether they are solid or merely superficial, by lines, shades, or colours (or the arts of *drawing* and *painting*), forms a valuable part of education, considered only as a stimulant of the perceptive faculties, increasing considerably the power of seeing, and of seeing truly and rightly, all objects, and of perceiving many of their qualities and relations otherwise overlooked or not comprehended.

One who has been taught to draw has been taught to examine objects more carefully, to study them under various aspects and in different positions as to other objects; to measure, actually or mentally, their relative proportions, the effect of light and shade upon them, the changes that take place in their outline when looked at from various points, the nature and quality of their surface,—whether glossy or absorbent, opaque or transparent,—its colour, texture, &c.; and his mind is thereby rendered alive to the examination of combinations and qualities of other kinds and belonging to other departments of his mental training. The time has now passed, I trust never to return, when mere reading and writing were considered the only necessary *education* of a large section of the people. These are now felt to be only instruments of education — keys to open the door of knowledge, but not in themselves knowledge. Now, as far as knowledge consists in a perception of the nature, qualities, and properties of things, I have shown that *drawing* must be considered a valuable part of the science of education. But drawing has

yet another great use—as a means of explanation—as a language, by the aid of which men may explain and describe, far more readily than is possible by words, the forms and other properties of objects: that which can be conveyed but imperfectly by pages of writing, may be readily and accurately described by the graphic sketch of the practised draughtsman, and that as intelligibly to the Chinese or the Indian, as to the European, or to his own countryman.

Thus, for instance, if I were to attempt by words to describe a flower to one who was unacquainted with the scientific terms of botany, how little impression of it would they convey to his mind! I might say, that the flower hung downward from the bough; that it commenced with a long stalk; then there was an oval-shaped knob, which was the early state of the seed-pod or vessel; that below this, with an indented neck between them, was another larger oval-shaped hollow form; that this was again drawn into a smaller neck; and then, spreading out, the tube was split into four leaves, shaped like the tops of spears with their points downward and spreading at the points, and that this part was of a bright crimson colour; that within this was a leaf twisted round of a purple colour, out of which hung a long whitish spike with six other shorter white spikes, &c. &c.; but, after all, what does this bring to the mind?—while, taking the chalk in hand, it is at once made apparent to every one; and, if drawn to the right size, I think few would fail to recognise the fuschia.



Thus then drawing becomes, so to speak, a lan-

guage of accurate description, a universal medium of explanation, and moreover may be, to men of other professions as well as to the artist, a means of treasuring facts and collecting stores of truths; and the surgeon and engineer, the botanist, the zoologist, the entomologist, and indeed many other professions, may, equally with the artist or the architect, write down in such a shorthand the interesting facts of their profession; while the manufacturer, the tradesman, and the artizan can by its means keep a common-place book of valuable hints and recollections. Again, by means of drawing, the employer and the employed interchange their mutual wants in a manner so easily intelligible that mistakes and errors are almost precluded, and the time and property thus saved amply repay the hours of study necessary to attain such a means of intercommunion of ideas. Added to all these advantages—advantages, you will observe, common to all men — there is this further one, bearing expressly upon the objects for which Schools of Design were originally founded by the Government, namely, that the training in form, in proportion, in beauty of contour and in colour,—in fact, the education of the eye necessarily obtained by the practised draughtsman,—together with the study of the examples which in the course of training will be set before the student, so influence his judgment, and so improve his taste in the progress of their acquirement, that another great end now proposed by this Department will have been arrived at, and we shall have educated a public qualified to perceive and prepared to appreciate what is right in principle, refined in taste, graceful in form, and harmonious in colour, in the decoration of our various

fabrics and manufactures. To arrive, however, at this valuable result, the training given to the student must not be of a desultory nature, but advance step by step in a defined course. We have no short cut to offer, but must endeavour to enforce that course which experience has shown to be attended with the best results; and, in any new directions wherein instruction is to be given, to proceed in the manner which general experience and full consideration shall point out as likely to prove most effectual. Believing that there is no royal road, we feel that what is good for the peer is good for the peasant also, in kind at least, if not in degree; what is proper for the artizan is proper, also, for his employer; and that no training less than that which tends to a perfect education of the eye to see, and a perfect subjection of the hand to execute what the eye perceives, can be right in us to adopt, or for you to seek to obtain.

When we reflect upon what was formerly the mode of teaching drawing in our schools and seminaries, public as well as private,—to which perhaps many of you were subjected, as I myself was in my school days,—you will be satisfied that the method then in vogue, and not yet entirely superseded, was not of a character to lead to the end I have just alluded to. It barely consisted in rudely imitating a few flimsy landscape-drawings in pencil or water-colours; when, if there was any traceable resemblance between the example and the pupil's copy, the master added "*a little touching up*," to make it pass muster at the Christmas holidays, when, duly mounted and enshrined in silver paper, it was sent in with the Christmas bill, as a peace-offering to set against the amount of the "drawing account," im-

posing itself on the poor simple parents (ready enough to believe in the talent of their offspring) as a real gem, from the care and pains with which the jewel was mounted.

But was this drawing?—was this the useful art I have attempted to describe? Proportion had no study,—the imitative faculties were hardly called into action,—the work had no reference to any thing in nature; it was called a landscape, it is true, but it had been so emasculated and conventionalised by the master to bring it within the power of the pupil, and he, in his turn, copied it so unlike the original, and with so little thought of the *thing* represented, that when finished it had little in common with the heavens above or the earth beneath; and the pupil left school, of course, perfectly powerless to use drawing in after-life for any of the purposes I have described.

Let me add, that the art-teaching which I have just described was considered almost a luxury of education, an extra given only to the upper and middle classes, whilst it is now considered desirable to offer to all that intelligent instruction, of which I previously pointed out the uses and advantages. For the Lords of Her Majesty's Privy Council for Trade, to whose jurisdiction the department of Practical Art appertains, have come to the conclusion that elementary instruction in drawing should now be imparted to all classes. The question then arises, how, then, can this instruction be best afforded; and what are the readiest, simplest, and, at the same time, most effectual means towards that end? On this subject opinion has been greatly divided, and two opposite modes of study have been advocated. One method

inculcates the use of *real models of* SOLID *objects* only, as examples for study, which are to be at once imitated on a flat surface under all the changes incident to the varied position of the various pupils in relation to the model. This method, promulgated in France as the system of M. Dupuis, was introduced into England by the late Mr. Butler Williams, and received the patronage of the Committee of the Privy Council for Education; those who would wish fuller information as to this course of study will find it in the valuable works of Mr. Williams, published by Messrs. Parker of West Strand. The other method advocated the use of flat examples only, as a means to educate the eye and hand to correctness and obedience; and I will now endeavour briefly to point out their separate advantages and defects in reference to a plan of general public instruction in drawing. The first—the method of Dupuis and Williams—is certainly calculated to enable the pupil to comprehend the apparent forms of *solid* objects, and to represent those forms on a flat surface. Moreover, without entering into the theory of linear perspective, it gives certain empirical rules which greatly facilitate the student in drawing the true appearance which *objects* present to the eye, whilst by this system the real object is united in the mind of the pupil with its pictorial delineation. These are important points, doubtless; but, to counterbalance these merits, this system at the outset offers three difficulties to the student instead of two. He has not only to train his eye to a sense of correct proportions, and his hand to obedience in delineating them, but, at the same time, to master the difficulty of seeing objects not as they really are, but as they would

appear on a plane intersecting the rays passing from their various parts to the eye,—in point of fact, with an uneducated eye and untrained hand, to endeavour to reduce solid forms to a surface representation of them, and consequently has, from the first, to contend with so many explanations, rules, and technical terms, as to oppose serious obstacles to his progress.

Even when the perseverance of the student does overcome these difficulties, the best qualities of the draughtsman have not been obtained; but delicacy of perception, and an appreciation of refined form, are partially sacrificed to a coarse and bold style of imitating a few models of the most obvious solids. Nor is this all. However theoretically perfect this method of teaching may be to give a power of imitating solid objects, it is yet defective in an important point as a system of GENERAL INSTRUCTION in drawing, and more especially so as connected with this department of Practical Art. The geometrical representation of objects—and by geometrical representation I mean the real imitation, exact as to parts and proportions, as contrasted with the perspective delineation (in which sense the act of copying a flat example, or drawing, is a geometrical imitation of that example), has no place in it, and seems perfectly overlooked. Mr. Williams sets out with saying, that "all *real objects* have three dimensions, namely, length, breadth, and thickness;" which, though theoretically true, is not really so, since drawings and patterns are objects as well as solid bodies, and yet, as such, have only superficial dimensions, and not thickness. Passing over these entirely, Mr. Williams proceeds at once to treat even lines and

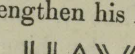
plane surfaces perspectively. Now, in any general method of teaching drawing, and quite apart from any special direction, this exclusive attention to solid objects and their perspective delineation is insufficient. It ignores the wants of a large class, indeed of large classes of students, and denies a large share of that knowledge which every man requires as a part of such instruction. How many are there to whom a power of geometrical imitation is far more valuable than that of perspective imitation! For instance, in all drawing as explanatory between employer and employed, in working drawings, and patterns, from the plans used by the carpenter and gardener to the patterns for the sempstress and embroiderer, a power of delineating exact superficial forms is needed, and for many of such purposes a knowledge of linear geometry also; nor is any course perfect without instruction in such drawing.

Even viewed as a means of training the perceptive faculties, it would be difficult to show that the imitation of refined and beautiful forms, although from flat examples, — the study thereby of symmetry, balance of parts, beauty of curvature and proportion, when combined also with mechanical geometry and theoretical perspective, — was not as efficient to sharpen and improve the perceptive faculties, as the effort to draw solid forms correctly on a plane surface alone. Having been thus lengthy on the merits of and objections to a pure system of Model Drawing, I must say a few words on the other method, — that of teaching from flat examples. This is calculated to remove some of the obstacles which impede progress, since the mind of the student is not occupied with the difficulties arising from having to reduce solid forms

to a flat representation of them. The hand-training also having a larger share of attention, the fault of coarseness, and mere symbolic drawing, is in some degree avoided; and by this method the eye is left more completely at liberty to dwell upon proportion, balance of parts, and beauty of curve. At the same time, the student is apt to overlook the THINGS themselves, to dwell solely on the drawing, and not on the object drawn: he thus obtains only the power of imitating a drawing, and, set down to a real object, he is too often found utterly powerless to represent it truly.

I will now proceed to explain the method about to be adopted in the schools in connection with this department; but before doing so let me revert to my former illustration of the fuschia, to explain the various modes of imitating form by drawing, to which I have already alluded, and which are united in the skilled draughtsman. The first mode of imitation consists in drawing from flat examples, or copying a drawing already made,—as the fuschia at page 44., for instance. This mode may again be subdivided into *geometrical free-hand imitation;* and geometric drawing wherein the draughtsman is aided by the use of instruments, applicable to right-lined forms and curves of known centres. The second mode consists in copying the thing itself; as if a real fuschia, or any other *object*, were set before the student for imitation; this may be called the *perspective free-hand imitation* of objects; here, also, in the production of right-lined objects, the student may be assisted by instruments, as is the case in linear perspective. The third mode consists in drawing from memory any required object, either free-hand or by means of in-

struments: this must be the result of much prior labour and observation, assisted by a thorough knowledge of the theory of Perspective, and shows the finished and skilful draughtsman, according as such representation from memory is more and more correct.

In order to avoid the several difficulties and defects of the two systems of instruction already described, and to comprise what is really valuable in both, so that the student may be qualified to draw, not only from flat examples and from objects, but in the end attain the further qualification of drawing from knowledge, which is so valuable to all, it has been determined to adopt a mixed system of instruction, and to divide elementary teaching into two short courses. The first from flat examples, wherein the pupil will have set before him for imitation, and to train his hand, *drawings* of forms taken from objects which in themselves are superficial, or whose general aspect is flatness; so that he will not be imitating entire abstractions, but be reminded at the same time of a known object. Thus in order to commence with right lines in various positions, of various proportions, and at various angles, the right-lined letters of the alphabet, simply drawn of a sufficient size to exercise and strengthen his hand, will be used as examples, as  together with the forms of other superficial right-lined *objects*. As he proceeds to curved-lined forms, the first examples will be from the curved-line letters, , &c.; following these, other superficial cnrvcd forms will be used; and afterwards,

drawings of the *symmetrical* forms of leaves, such as the laurel, ivy, plane, horse-chestnut, sumach, &c., to accustom him by *geometrical imitation*, to proportion, balance of parts, and beauty of curve; the whole forming a first course of geometrical free-hand imitation, preparing him, if his future occupation renders it desirable, to take up a further course based on the more abstract curves of ornament, and leading to admission, if it is required, into the elementary schools of Ornamental Art.

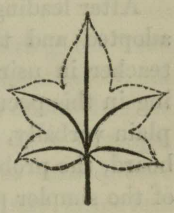
As a completion to this first flat course the student will be led through a short course of mechanical geometry, with the use of instruments, to give him thereby a precise knowledge of superficial forms, and that means of accurately measuring and setting them out, which is so valuable to *all*, and especially to the workman. Thus armed with some amount of hand power, some training of the eye, and a degree of knowledge of *technical terms*, the pupil will be prepared to enter upon the elementary course from *solid examples*. In this course *solid objects* only will be set before the student, the master giving such verbal instructions, and such illustrations on the black board to the pupil, as will enable him to proceed, step by step, from a line seen perspectively, to a plane surface under all its perspective changes; to combinations of plane surface forming solids, and their perspective change to the eye of the student; afterwards passing through spherical solids, until objects of beautiful contour, such as vases, shells, &c., are set before him for imitation, his perceptions being trained, step by step, to comprehend and interpret the various difficulties that arise. To complete his real knowledge in this section, a short course of

linear perspective, with the use of instruments, will be prescribed to the student, to give him a theoretical knowledge of the cause of the apparent change in the form of objects relatively to the surface on which they are delineated, and the points from which they are viewed;—the course terminating in *his being taught* the most effective means of producing the appearance of light and shade and relief by black and white, by the use of crayons and the stump on tinted drawing-paper.

Such a combined course of elementary instruction as has been described will, when completed, have given the student a power of close and refined imitation from the flat, a knowledge of the elements of practical geometry and perspective, and the power of drawing from objects themselves;—combining the truly valuable points in the system of Dupuis and Williams, with that other instruction which is wanting in their course, and preparing the student, if desirous of further progress, or whose business in life requires further instruction, to enter the Government Schools of Ornamental Art.

The pressing demands made upon the Department for assistance in Elementary instruction has necessitated an arrangement which was explained to you by the General Superintendant in his lecture. It has been found necessary to appoint a "teachers' training master" not to interfere with the class for training masters at Somerset House, to which I shall afterwards call attention, but to enable the masters in national and other public schools, not yet able to afford or to obtain the assistance of a regular drawing teacher, to make use of the drawings and models which we are about to supply, and to carry on, at least temporarily, the course of instruction I have just explained to

you. Herein the instruction will be verbal and explanatory, the black board being used by the training master for illustration. For instance, he will begin with showing the value of horizontal and perpendicular lines; and, first making the masters aware of the necessity of thoroughly explaining these terms and all other terms used in the most simple language, will show that in geometrical imitation these lines are entirely governed by the sides and bottom or top of the paper, slate, or board used by the pupil: he will then explain their value as a means to measurement and proportion, and for determining the direction of oblique or slant lines. He will proceed to show how readily linear forms are drawn, when the constructing lines are first attended to,—as, for instance, the dark lines on which the dotted form of the leaf in the margin is constructed,—and what a ready means these constructing lines are of giving the pupils a sense of balance, proportion and symmetry of parts. This will lead him to explain the nature, properties, and relative proportions of the various other forms, and the structural lines by which they may best be geometrically imitated, ever impressing upon his class, that, in their capacity of teachers they must use the most simple language and carefully abstain from the use of technical or scientific terms. Not to dwell too long on this part of my subject, the training master will next explain the method of teaching from model forms. First taking into his hand a rod of wire, he will show the class its change of form relatively to its changed position in re-



spect to the draughtsman,—from appearing as a mere point, when presented directly to his eye, to its being seen of its real length when parallel to him. The class will then be shown how the same changes take place in a superficial square,—from its appearances, as a mere line when its edge is placed towards the eye, to its perfect equal-sided right-angled form where the front of the object is directly opposed to the spectator. After this, the changes in the form of a cube will, in the same manner, be explained and illustrated, —from its appearance as merely a superficial form to the development of first, two, and then three, sides, as it is variously placed before the draughtsman.

After leading the class to comprehend the course adopted and the methods to be followed by the teacher in using the examples, those who are training in this peculiar class will next be required to explain verbally, and with rough diagrams on the black board, the problems of Practical Geometry, and some of the simpler problems of Linear Perspective; thus instructed, and with the aid of a "Manual for Teachers," which is in course of preparation, we may hope to meet the immediate pressure on the department, until masters more thoroughly qualified can be instructed for such duties, or whilst these teachers proceed to acquire in the class for masters at Somerset House that power of drawing which can alone render them fully eligible to instruct others. I now proceed to the methods of instruction followed in the Government Schools of Ornamental Art.

Having explained to you the methods adopted to teach Drawing as a branch of general education,— its use being as an aid to perception and a language of explanation,—I have now to speak of the course

of instruction in *Ornamental Art*, which instruction, although in some degree special to the artizan and designer for our various manufactures, is yet, more or less, necessary to the manufacturer who produces their labours, to the merchant who sells them, and to the public who are to be the purchasers and consumers. For this reason, the views formerly entertained restricting this instruction to artizans, and to those whose special business is to *design*, have been modified, and the teaching is now open to all who choose to avail themselves of the advantages the schools and class-rooms offer, if they, on their part, can show that they are capable of availing themselves of these advantages.

Heretofore in my explanations Drawing has been viewed as a part of the general education of all classes, and, of course, the time to be devoted to its practice could be but small (probably, on an average, not more than two hours per week), in consequence of the equal or greater claims of many important branches of instruction. But now we come to view Drawing relatively to those to whom it may be hereafter an important part of the general business of life,—those who will be able, from having completed much of their previous education, to pay special attention to Art, and to give up to it a large share of their time, and who, as the elementary instruction before described begins to develop itself, will come to these higher schools prepared to benefit more immediately by their teaching. At the same time, it is necessary so to adapt this teaching, that, while it will be fully adequate for all to whom Art will be the business of life, it may be useful also to the public, and enable them to avail themselves of such parts of

the course as may perfect what they have already attained in the Elementary Schools, and teach them those general principles which are to regulate the judgment, and refine and improve the taste of all: for this purpose, Schools for the attainment of technical skill are necessary; a Library, wherein Art must be the predominant feature; a Museum of the rarest works of art and manufactures; and Lectures by various professors, on subjects connected with the special direction of the art in its future application to manufactures.

I shall proceed, in the first place, to describe the methods of instruction adopted in the schools, since the library, the lectures, and the museum will be referred to more particularly in the third part of my address. There are some modifications in the arrangements connected with Schools of Ornamental Art, both in London and the provinces, arising out of local circumstances, which it is not necessary to enter upon here; it being better to explain the general course, rather than to refer to exceptional changes. Up to the present time, the general education of students entering these schools has had no consideration; but it is intended to require in future, from all who seek to enter the morning classes, a certain proficiency in reading, writing, arithmetic, and some of the simpler geometrical problems. The instruction in these schools is arranged under four heads,—Drawing, Painting, Modelling, and Composition,—these four sections being subdivided into twenty-two stages: not that each student must pass through all these stages, but that such a course affords complete instruction in the technical means of drawing, painting, and modelling, and includes some insight into Ornamental Composition.

The stages are usually classed as under:—

			Stage
Drawing Course		Geometrical Perspective and Architectural detail	1
	Ornament	Outlined from flat examples	2
		„ „ the round	3
		Shaded from the flat examples	4
		„ „ the round	5
	The Figure	From flat examples	6
		Outlined from the Cast	7
		Shaded from the Cast	8
		Anatomy	9
		Flowers, outlined from Nature	10
Painting Course	Ornament	In Monochrome	11
		In Colours	12
	Flowers	From flat examples	13
		„ Nature	14
		Compositions of Objects as Studies of Colour	15
	The Figure	From Casts	16
		In Colour	17
Modelling Course		Ornament	18
		The Figure	19
		Flowers and Objects from Nature	20
		Studies from the Life	21
Composition in Design		Elementary Design	22

I must, however, remark upon stage 1.,—Geometrical and Perspective Drawing,—that, although placed as the commencing stage,—Geometry being the basis of all ornament,—in practice it is rather the second stage, and should change places with stage 2.; the student really commencing with a severe course of Ornamental Drawing in outline from flat examples, which experience has proved to be a very efficient means of giving the fullest power to the hand and correctness to the eye; the first being obtained by drawing the long, flowing, and graceful curves of ornament,—such study correcting the one-handed direction of lines, if I may so describe it, which has resulted from writing; the other,—correctness of eye,—arising from the nicety required to imitate the pure curves of ornament, and its sym-

metry, and exact balance of parts; — qualities not usually found in natural objects, as seen and drawn perspectively.

I need hardly lead you, step by step, through this varied course,—it speaks for itself,—as to the power which must result from earnest study on the part of the student: I will rather make general remarks on the whole course, and on any stages that may appear to want explanation. You will at once perceive that the same system prevails in this as in the before-described Elementary Course; and here, at least, we have the experience of some years of success to support us in its value; I mean, the practice from flat examples before the use of *solids* and *objects*, but with immediate recourse to the *objects* on the student attaining hand-power to execute them.

Thus you will notice that stage 2. is ornament outlined from flat examples, while stage 3. consists of ornament outlined from the cast, or from solid forms; and in this stage solid objects, such as the Models of Dupuis and Williams, are used, as well as casts of ornament. Here, also, the previous study of Practical Geometry and Linear Perspective aids the student in comprehending the changes of form which take place on any change of his relative position as to the object he is drawing from, and which, to draw it correctly, he must now understand. Then, again, stage 4. is shading from flat examples, while stage 5. consists of studies from the round, or from casts in relief; and so on throughout the course from the figure to flowers and fruits — in painting, as in drawing, the same system prevails. In the painting stages practice is commenced in light and shade by black and white only, and, having learnt to over-

come some of the first difficulties of execution without colour, the student then has coloured examples set before him. As his powers of execution improve, he makes separate studies of flowers, fruit, &c., first from flat examples, and afterwards from nature, proceeding in the end to group and arrange coloured objects as a study of composition.

All are taught to paint in transparent water colours, in tempera or body colours, and in oil; and, where such special means are necessary, in encaustic and in fresco also. In passing through the painting stages, the pupil is required to answer any questions that may be put to him on the laws of colour, its harmonious arrangement, and the relative quantity of tint or hue which is agreeable to the eye on any general distribution; and he is thus prepared to enter upon the study of Ornamental composition, in stage 22. If the future business of the student requires modelling for its expression, rather than painting; after he has passed through the first ten stages, he begins to work in clay, and models first from reliefs or round examples, and afterwards, as he acquires facility and power, from flat examples; as, for instance, from prints and drawings, rendering their apparent into real relief, thus reversing the mode of study in the stages of drawing and painting. The study in this section is conducted, first from ornament, then from the figure, and afterwards direct from nature, as in fruit, flowers, and from the human figure and animals.

Having thus acquired a competent share of technical skill, the student is prepared to enter upon Elementary Design, — the twenty-second stage of progress. Hitherto the study of the pupil has been

strictly imitative; that is to say, he has obtained technical skill in the use of his tools and materials by means of exact imitation, and, in this respect, the route of the artist and the ornamentist has been so far the same. But in this stage the special direction of the latter, which had as yet only been suggested by the examples used for the purposes of study, becomes real; and the ornamentist enters upon the consideration of the fundamental principles wherein his Art differs from *Fine Art;* the latter continuing to rely on a selected imitation of nature, pictorially and perspectively treated, as his means of expression; whilst the former — the ornamentist — is taught to make use of whatever is beautiful in nature, either in form or colour, irrespective of imitation or actual combination; — nay, often designedly rejecting them: choosing the general expression of objects, rather than likeness; symmetry of parts and balance of quantities, rather than variety; the normal rather than the individual form; beauty of line, rather than peculiarity of structure. In this stage the ornamentist has explained to him the leading characteristics of styles and periods of ornament, and the laws which ought to govern its application to various materials. His formerly-acquired knowledge of linear geometry enables him to regulate the distribution of the quantities of his ornament over large surfaces. He is taught how to conventionalise and reduce natural forms to ornamental ones; to arrange colour on given spaces, according to the laws of harmony and right proportional quantity, and strength of tint, hue, or shade; and having, during his progress through the prior stages of the schools of Ornamental Art had opportunities of attending the

lectures of the Department on styles and periods of ornament, and their general characteristics, he ought to be prepared to give his knowledge some specific direction, by entering into some one or other of those special classes which are to be described in the third part of this address. I ought to mention that the same course of instruction is adopted for both Male and Female students.

Before passing from these schools, however, I must notice a valuable additional class which has been formed for the education of masters for the elementary schools. In this class, after having passed through the first six stages of the before-named course, modified to suit their peculiar wants, these candidates for masterships have themselves a class to teach, to which they give verbal instructions and illustrations on the black board in geometry, perspective, and the method of drawing from models, in order to prepare themselves for their future duties as masters. In the performance of this duty they are required to use the simplest terms of explanation, so as to make themselves intelligible to the most uneducated, and to endeavour to interest the minds of the students in their work by apt illustration and intelligible language divested of technical terms.

There are two classes at Marlborough House which, in some degree, are supplementary to the course of instruction at Somerset House. I will shortly explain them before proceeding. The first of these is, the

Class of Artistic Anatomy.

This class (together with that for Architectural Details and Practical Construction) is complementary

to the instruction given in the schools of Ornamental Art, and is required to have been passed, or, at least, that its studies should have been commenced, before the student can enter into some of those special classes hereafter to be described; — such, for instance, as those for Metal Working, or China Painting. It combines the study of the human figure with that of its anatomical structure. Occasional reference is also made to the comparative structure of animals. It is necessary that the student, before entering, should have attained proficiency in drawing and painting, or drawing and modelling, either in one of the schools of Ornamental Art, or otherwise; so as to be able to benefit immediately by the special instruction of the Professor. The plan adopted is that of analysis. The student commences with making careful drawings in outline from casts of the head or extremities of the human figure, and afterwards, under the instruction of the Professor, describing within that outline, in their true position, first, the bony support of the parts, and then the muscles which give them motion and largely determine the form; finally, he completes a study in light and shadow from the object, in the same position. After studying the extremities, he proceeds to the complete figure from the antique; first outlining the figure, then placing the bony framework within the outline, and afterwards the forms of its outer layer of muscles; the Professor explains those more deeply seated, and remarks upon the action of both as motors of the figure studied; and the same figure is afterwards carefully studied by the pupil in light and shade. This method is adopted also for the student of painting and modelling. In due course

the modeller is taught also the principles of relief, both high and low; while the painter has explained to him the various technical modes of flesh painting.

From time to time the living model is set in *pose* by the Professor, for the pupils to study, and explanations of the position, and of the muscles called into action by it, are given during the period the model sits. The studies in this class, also, are either by drawing, painting, or modelling, and after each *pose* is completed, the figure is analysed by the student, who follows the method before described in his antique studies.

Occasionally, a limb, or some other portion of the structure of an animal is dissected and demonstrated to the pupils, and compared with the same portion of the structure of man: as, for instance, the pectoral muscles of birds, which are largely developed to assist in flight, are compared with those of man, or with those of quadrupeds, such as the horse or deer, wherein the action of the fore limb is simply progressive. The pupils are expected to make drawings of such dissected portions, after the clinical demonstration by the Professor. Such studies as those I have explained to you, prepare the designer or the artisan for the highest art development of his profession, and fit him to exercise his skill and manual dexterity in the metal class, in china printing, or in architectural decorations, wherein the ornamentist is as nearly as possible merged in the artist.

Class of Architectural Details and Practical Construction.

This class, as well as the class of Artistic Anatomy, is in some measure complementary to the instruction

given in the School of Ornamental Art at Somerset House. It must be remembered, that the public has not yet arrived at a belief in the necessity for our dealing with Architecture as a science or as a fine art; as requiring the exercise of the inventive faculties, or the application of the principles of science to construction. At present, therefore, the student is only taught to reproduce to the eye what has been already done, and to delineate the inventions and scientific adjustments of others; whether or not it is desirable or possible so to restrict ourselves, we must leave to the public to determine by the amount of instruction they may hereafter seek to obtain from the classes of the Department.

The student on entering the class of Architectural Details is required to go through an extended course of Practical Geometry, and is afterwards taught to apply it to the purposes of practical construction, in laying down the lines for, and setting out, carpenters', joiners', masons', smiths' work, &c. He is taught, for instance, to make drawings of constructive carpentry, including the framing of roofs, floors, partitions, staircases, &c.; the modes of obtaining the moulds of groin angles and intersections, the stretch-out of soffits, and generally whatever will enable him to prepare accurate working drawings of construction for the craftsman in any trade.

He then enters upon a course of architectural details, such as the sections and forms of mouldings, cornices, architraves, &c., the proportions of the various classic orders, the details of Gothic architecture, and the methods of finding the structural lines and centres of Gothic tracery. Plans, elevations, and sections of apartments, and portions of

known buildings, are laid down, from drawings or written dimensions, to scale measurement. The student proceeds to an extended course of linear perspective, to enable him to delineate buildings, furniture, or utensils, to scale measurements from their plans, elevations, and sections. In the progress of his studies he is taught the scientific projection of shadows, applied to architectural drawing, as well as the methods of tinting required to complete such studies. Where necessary, isometrical perspective is added, and thus all may be more or less prepared for their duties in life, or for entering those special classes, which I shall endeavour to explain after some remarks on the necessity for their establishment.

Having described the methods adopted to give elementary instruction in *Drawing*, and instruction in Ornamental Art, I have now to speak of those classes which have been instituted at Marlborough House, and which, in conjunction with the further aids of a museum, a library, and lectures, are intended to complete the education of the Ornamental Designer, and to give special and definite direction to his labours; and not only this, but to be the means of educating the taste of the general public, by whom his labours, to be successful, must be appreciated. Before the establishment of this Department, the Government Schools of Design, after giving the pupils technical skill in drawing, painting, and modelling, and imparting to them a knowledge of ornamental styles, were expected to enable the student to turn his attention to designing for any special branch of manufacture which he might determine to pursue; for this purpose it was not only

necessary to teach him the principles and laws which should govern the application of ornament to peculiar fabrics and manufactures, but the *processes* which govern the production or fabrication of his *design.* In old times the designer and artificer were frequently united in the same person, and the mind which originated worked in perfect accordance with the hand which produced; a few trade secrets being all that was needed beyond the technical skill of the workman. This was largely the case with the mediæval artists, as well as with those of the finest period of the *renaissance.* Their effort was to produce *one* work, and to produce it perfectly, without reference to a series or to repetitions. Even in cases where the designer and craftsman were not united in the same person — since machinery had little to do with production, and all works were more or less perfect hand labour — the knowledge of the possible in the designer was complete. But in our days, when one design has to be repeated by thousands, and the most complicated machinery is planned to execute it, the designer has constantly to keep up his knowledge of the capabilities, and to acquaint himself with the powers of the machine; he has to study its capacity to produce his ornament, and not only to produce it, but to produce it in the manner least costly to the manufacturer, who, exposed to constant competition, has on his part to strive continually after new movements — new actions of the machine — to render less costly the complicated and difficult designs required for the market. An impossible colour or tint may change the whole beauty of a design in the production. One colour more or less may add to or diminish the cost, making it be-

yond or within the price possible for the manufacturer; even the alteration of position of the same colour or tint may have such an effect on the cost of production as to eat up the profit of the manufacturer. Moreover these points, by the production of new machinery, by increased chemical knowledge of new mordaunts and dyes, or new adaptations of old processes (as, for instance, of the machinery used for calico printing, to printing paper hangings, which has quite changed the state of the trade), are in a daily state of fluctuation and change.

When all these circumstances are considered, you will at once see the impossibility of a master—whose time is already occupied in giving instruction in Drawing, Painting, and Modelling, as well as in Styles of Ornament—being supposed capable of keeping pace with the improvements and changes not alone of *one*, but of all branches of manufacture requiring Design: and who could blame the manufacturer for not purchasing designs; which, although in good taste, and in conformity with the laws of Ornament, for want of this knowledge being imparted to the student, had to be so modified to permit of their production, as entirely to alter their character, and largely to impair any originality they might in the first instance possess. We ought not to be surprised, therefore, that the manufacturer was contented to retain those designers, who, if less educated in point of taste, were aware of the best means of fabrication, the conditions that regulate cost, and had that amount of taste at least, required to satisfy the purchaser, and to furnish the demands of the market. It was from these considerations that it was thought necessary to institute special classes, wherein the

students, after having been taught Drawing, Painting, and Modelling, in the schools, should apply their powers, under the instruction of able professors in special classes to produce designs, and, in some cases, to acquire technical skill as Art-workmen. In such classes the student will be able to obtain information; first, as to all the principles of fitness and choice which should govern the application of Ornament to the special fabric or manufacture; and, secondly, as to all those peculiar processes of Manufacture, whether by the hand or the machine, which are to control and regulate his labours, together with all improvements, chemical, mechanical, or manipulative, which from time to time arise to change the laws of production. The professors will be aided, in these respects, by a staff of able lecturers, on the history and styles of Ornament — on Chemistry, Botany, Metallurgy, &c., connected with Art, and on any other subjects that will give information to the public and the student on these questions. Moreover, there will be at hand a Museum containing the rarest works which can be obtained; excellent either for design or for skilful execution, and a consultation room supplied with specimens of the best current productions of the manufacturer, in order that the state of the markets may be ascertained, and the direction of public taste, so as to aid us in the endeavour to turn it, as best may be, into those channels which seem most consonant with what is excellent, beautiful, and true. Here, also, will be at hand a library of reference, containing plates and descriptions of those rare works of past times, which are otherwise inaccessible, and wherein the literature of Art is ever ready to the student's hand.

Of these Special Classes, five are already in operation.

A Class for Wood Engraving; at present, for females only.

A Class for Chromo-lithography; at present for females only.

A Class for Woven Fabrics and Paper Hangings; for both sexes.

A Class for China Painting; for both sexes.

A Class for Metal Work; open only to male students.

In these classes the student is first set to copy the rare works in the Museum of the Department, either those which are the property of the public, or those which may be lent from time to time for the purposes of study.

He has explained to him the peculiar processes used in their production, as well as the excellences of design or workmanship they display; and he then proceeds, under the instruction of the Professor, to exercise his invention or even his manipulative skill in the production of like works, embodying those excellences and those principles which he has learnt in the previous study, and employing all the ornamental knowledge and knowledge of the laws of construction and colour which he obtained in the schools. From time to time he visits the manufactories in company with the Professor, who there explains the actual processes and machinery, and points out the causes which must limit and modify the inventive powers of the designer. To stimulate his industry, a series of prizes are offered for designs for the ornamentation of the special fabric or manufacture, in which designs those conditions are to be

observed that the Department consider should regulate the application of Ornament to its decoration. To these prizes manufacturers are also invited to contribute; and it will be found, by our annual prize-list, that they are beginning duly to respond to the call.

Before concluding my address I have yet to trespass a short time on your patience, whilst I say a few words on the education of the public, whereby to enable them rightly to appreciate what is just in taste and excellent in Decorative Art. Though last to be spoken of, this is certainly not the least of our duties, since, unless effected, it is to be feared that all other efforts will be useless, and any improvement in design a thing beyond our hope. Until men turn their attention to the subject they are little aware how entirely empirical most of their judgments in matters of taste are, and consequently, as to what is correct and just in Decorative Design also. Men are inclined to believe that judgment on objects of taste does not depend on any acknowledged principles nor can be defined by any rules, but is an innate feeling or perception; and the trite maxim that "*taste* is not to be disputed" — which is as much as to say that it is amenable to no laws — is still the measure of public opinion in the matter. It is true that we allow that there is a City taste, and a West End taste, a Provincial taste and a London taste; and although these are each known to have their distinctive differences and characteristics, they are considered to depend on the sentiment of this or that public, and are believed to be under no rules nor regulated by any laws. But is it really so? is true judgment in matters of taste neither to be imparted

by any teaching nor improved by comparison or observation? We venture to think not, and shall endeavour to point out what causes excellence, and give reasons for preference, as the *principles* which are to regulate and guide us; not as dogmas, or as infallible, but open to all objectors who diligently seek after what is true. The fact is, that the ignorance of the public in such matters is most melancholy, their want of guidance like that of a child, and deeply have they paid and are still paying for that ignorance. This causes men to rely on precedent and the authority of past times, or on fashion: instead of striving for proper information on which to found their judgment, and then thinking and judging for themselves; they trust to what has been done before as right, and do not stop to consider what should be done now,—what is suitable to present wants.

Let me give you two or three illustrations of this, turning first to Architecture, which must be considered as the parent of Ornamental Art. The rich man who is about to build a mansion in these days, does not set down to consider what is useful and what he really wants, how many rooms, what aspect for health, what arrangements for comfort, what order of distribution of the offices for convenience, but, referring to the past, or to some prevailing fashion, and considering decoration before utility, he instructs his architect what *style of Architecture* shall be adopted: his house must be castellated, Gothic, Grecian, or Italian; it must have a cloister, a portico, or a colonnade, whether it is to be a place he can live in when built or not. Thus instructed, and not allowed to exercise his own judgment, the architect also reverts to precedent and authority, and the

estate is cumbered, it may be, with a load of stones called a castle, with walls whose thickness increases the space in his client's pockets at the expense of space in his rooms, duly ornamented, no doubt, with corbels, battlements, and embrasures, things perfectly useless in the present age. The whole when completed is an unsatisfactory absurdity, and the employer pays the penalty, not only in money, but in the inconveniences of dwelling all his days in a dark, gloomy, unsightly, and inconvenient abode. It may be, however, that the builder of the mansion is emancipated from the rigours of mediævalism, and desires a palace or a hall in the Grecian style. It is furnished with a portico according to the strictest Greek proportions, but to allow of this magnificent portico the lower rooms are so lofty that their size dwindles into insignificance, the two wings are cut apart by a splendid entrance-hall and a staircase that leads to bed chambers lighted by *skylights*, for windows in the front would derange the architectural disposition; thus, the possessor, in a lovely country, open to the sweet breezes from downs and commons, with a far away sea, and a fair prospect around, pays the life-long cost of being unable to look out of his windows on the lovely landscape, that the outside of his residence may be decorated with a costly piece of inappropriate decoration. Even when men are about to build a church for the worship of God,—when, at least, it might be hoped that the best means of accommodating the worshippers, and the best arrangements for their joint worship, would have the first consideration,—it is not so; the war is still between styles of architecture; and if churches combined of Grecian temples and Gothic spires, edifices unsuited to our

climate, our feelings, or our wants, have at last passed out of date, gone out of fashion, it is to be feared, rather than been rejected on sound principles of taste, these have only made way for the re-introduction of a style wherein symbolism is thought of more importance than convenience, the form of the structure more than its fitness for the worship of God or for hearing therein the preached word of the Gospel. These forms may be suited to the ceremonial of that worship which we have laid aside, because it overlaid the truth with, as we believe, useless ceremonies, but are quite unsuited to our simpler worship, our larger concourse, or our desire to hear the words of the preacher.

Now all these evils arise from the want of an educated taste and judgment, which being wanted, men cannot or dare not think for themselves, but are in bondage to fashion, to authority, or to the traditions of antiquity. They neglect or have never had opportunity to learn even these simple rules, which would guide their taste and direct their judgment; namely, that utility should have our first consideration; that constructive propriety should precede ornamentation; and that each age has its own characteristic wants, which are unsuited to the wants of its successor; — rules that, although simple, would root out a large amount of false taste in all things, as well as in architecture, and might be the means of implanting an equal amount of correct judgment and good taste in their stead. But let us turn from architecture to see whether good taste in other matters may not be assisted and regulated by laws and principles; and since the leading characteristic of

architecture is *form*, let us consider the question in respect to Colour.

Colour has its laws of harmonious arrangement and disposition, and requires to be present in definite quantities in any distribution to satisfy and please the eye. Now, although it would not be true to say that this subject has had no consideration among artists or designers, since no arrangement of colour in any composition, either *pictorial* or *ornamental*, can be made without a consideration of some of these *conditions*, it would not be too much to say, that the arrangement of colour has been far too often considered an affair of the eye only, both by them and by the public; and that he who is born with a fine eye for colour — as of course every one thinks himself to be — has no need of rules to guide him. Thus too many have been accustomed to proceed *empirically*, and to laugh at laws they are not at the pains to understand. Now, there is no disputing the fact, that there are varieties of organisation in the human race; and it is well known that there are persons whose vision is perfect as far as the perception of FORM goes, with a completely disorganised sense of colour; so much so as to be able to read the smallest print and clearly to distinguish objects at great distances, yet to be unable to distinguish between red and green; and that from this state to the perfect perception of tints, hues, and their various minute gradations and relations, there is every amount of perceptive discrimination. Now, as all classes have more or less to do with colour, either in the choice of their furniture, their dresses, or the decoration of their houses, apart from any necessity which may belong to their occupation as workmen, manufac-

turers, designers, or tradesmen, it must at once be evident that a knowledge of those natural laws which regulate the harmonies of colours and their just distribution, while it is valuable to all, must be an absolute necessity to those whose business is connected with the choice or arrangement of colour, and that taste in colour will rarely be correct which is not founded on a knowledge of these immutable laws. It is necessary, therefore, to make them more generally known, not only to designers, but to all classes, who are called upon more or less to judge of its employment.

To give, however, some idea of the public education and the public taste as to colour, I may, perhaps, be allowed to relate two circumstances which I think will aptly illustrate the want of instruction prevalent in the matter of colour. Being lately in the workshops of a manufacturer, who employs several hundred workpeople upon a branch of industry largely dependent on colour for its decoration, and happening to speak of the laws of colour, I was interrupted by the remark, — "Laws of colour: to what do you refer? I was not aware that there were any laws of colour." It was to meet this ignorance that this Department issued the diagram of colour now before you*, which, at a small cost, gives, in words intelligible to all, some of the simplest of these laws; and it is hoped that its distribution in our schools, in our workshops, nay, in the nurseries of our children, will prevent in future such an inquiry as whether there are indeed laws of colour. The second incident occurred to me a short time ago,

* A diagram to illustrate the harmonious relations of colour. —Chapman and Hall, 176. Piccadilly.

when, being by accident early in the morning as a casual and unknown customer in the rooms of a carpet warehouse, doing perhaps as large an amount of general business as any house in London, whilst making my own purchase I was led to look round by overhearing a dialogue between the principal of the house and a manufacturer's agent, who had brought up a number of pieces of carpet as new patterns for the tradesman to choose from. His choice was no doubt regulated by what he could judge would be the taste of his customers. When I looked round I found, to my surprise (although, perhaps, it may not so greatly surprise you), that these several patterns consisted of but two showy designs, with very brilliant colouring applied, with perfect indifference, to the same ornamental forms; so that what was green in one was blue in another and red in a third, — at random. As harmony under these conditions must be impossible, and as only one *could* be right, whilst all might be wrong, I think it may illustrate the value that a knowledge of the laws of colour would have been, both to the manufacturer and the trader, and how little their choice could be consonant with what was really good taste, from their want of knowledge of these laws. To explain this I have prepared a diagram to show you that colours must be arranged together in specific and absolute quantities to be agreeable to the eye; it is founded on the experiments of Field, who laid down, from able researches and experiments, what these relative quantities must be. Thus, in arrangements of the primaries, a surface quantity of three yellow requires, to be agreeable to the eye, a surface of five red and eight blue; or three yellow harmonises with its secondary purple as

three to thirteen in surface quantity. If, therefore, in any composition these colours were used interchangeably in the ornamental spaces, it must be inharmonious, unless another law is attended to, which is, that a *hue* of colour diluted with white into a *tint*, requires a great increase of surface quantity to contrast harmoniously with its complementary full *hue*. Of these rules the manufacturer, however, did not seem in the slightest degree aware, since the colours were as full in hue in the one case as in the other. It is proposed to publish this second diagram and a catechism is being prepared with questions relating to the two, which students in the schools connected with the Department will be required to answer, and, which will be useful to the public also, in teaching some at least of those simple laws which must govern all tasteful distributions of colour.

Time will not permit me, even if it were desirable, to give other illustrations of the various ways in which taste is improved and informed; and that correct judgment, which is called *good taste*, acquired by the study of nature's laws, and of those rules which govern artistic and ornamental arrangements. I have said already that the public pays dearly for its want of instruction in those laws — pays, not by hundreds, or by thousands, but by hundreds of thousands: and this might be proved in a multitude of ways. I have just been speaking of colour. Now the least knowledge of its laws will show that the simplest combinations of colours are the most harmonious. Yet the paper stainer, the calico printer, the silk and ribbon weaver, the carpet manufacturer, and a host of others that I need not enu-

merate, are striving to gratify the public by introducing the largest possible number of colours into their patterns; thus, not only, by throwing away useless labour, rendering costly those few to which fashion gives a certain amount of success, but still further increasing their price by those numerous patterns which are failures in the market, being such faulty, overcoloured efforts after novelty — such lawless and abortive productions, that even an uneducated public cannot tolerate them, and they are sold off at the end of the season at a "tremendous sacrifice;" their cost, by the immutable laws of trade, becoming an extra charge, reckoned beforehand, on those which were at least less unsuccessful, which cost, of course, comes out of the pockets of the untaught public. And, if there is this loss on one kind of manufactures or fabrics, what must be the loss on all, when we consider the fearful over-ornamentation they too largely display? — the carving, inlaying, gilding, and burnishing that are thrown away upon them — for where there is much ornamentation we may be pretty sure that it is in bad taste or ill applied. Let me then, in conclusion, point to the other instructional advantages this Department offers to the public, which, if made proper use of, will soon save that public, individually and corporately, far more than the cost of the Establishment. First, then, there is the use of the Schools, both elementary and ornamental, now open to all who choose to pay the regulated fees and follow the prescribed course of study. Secondly, the public Lectures of the Professors conducting the special classes, by whom the laws which govern the application of Ornament to the fabrics they have in charge, will be illustrated and explained.

Thirdly, the Library — open to all on the payment of a trifling fee — wherein the best works on Art and Ornament may be consulted; and, Fourthly, the Museum, wherein the best examples of Decorative Art, and of Art workmanship, are placed before the public. In which Museum, also, it has been thought desirable to place, at the very entrance, a selection of fabrics decorated on *false* principles of taste, and to insert in the Catalogue, for the information of all classes who will take the pains to consult it, those laws of taste which are considered to be infringed in these productions, so that he who runs may read, and those who will not go more deeply into the subject may have no excuse for entire ignorance.

THE END.

LONDON:
SPOTTISWOODES and SHAW,
New-street-Square.

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ON THE

NECESSITY OF PRINCIPLES

IN

TEACHING DESIGN.

DEPARTMENT OF PRACTICAL ART
ON THE
LIBRARY.

ON THE NECESSITY OF PRINCIPLES

IN

TEACHING DESIGN.

Being an Address

By R. REDGRAVE, R.A., Art-Superintendent,

At the Opening of the Session of the Department of Science and Art, October 1853.

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AN ADDRESS,

&c. &c.

THE Session of the Department of Science and Art for 1853-4, as far as it relates to Art, commences this day; and the opening of the schools and classes gives an opportunity to address you in explanation of the teaching of the department in certain parts of the instructional course.

By the removal of the School of Art from Somerset House to this building, there are means provided for carrying out here a complete and systematic course, both for the acquisition of technical skill and execution, and for obtaining a knowledge of the principles which should guide the application of such skill, when acquired, in the practice of Design; and it is to this latter subject that I am about to advert.

Executive power, arising from the training of the hand and eye, is so obviously a first requisite of the artist, that its acquisition has, in some degree, obscured the importance of understanding the principles which regulate its successful application, and thus given an undue prominence to the mere executive means. Yet

it ought hardly to have been requisite, in the present day, to have to uphold the necessity there is of imparting to the student rules and principles to guide him, or to maintain that every art and science must be regulated by them. It is no doubt true that rules and principles, however derived, whether from natural laws, or gathered from past practice, should not be fetters to restrain the matured genius (who may and will break through them when intellectual strength renders their support and guidance less necessary); still such rules and principles must always be valuable to the teacher, enabling him to convey to the student a knowledge of those restrictions which the laws of Nature impose, and those considerations which, being found consistent with other truths, have governed the practice of the skilled artists in all ages—that cumulative stock of experience, in fact, which, had it to be separately gathered by each individual, life would be wasted in preliminary study.

What should we say of the musical composer, who, thinking only of the fingers of his pupil, gave him no insight into the natural laws of harmonic intervals, or those principles of counterpoint so essential to the agreeable arrangement of musical sounds? or of him who should leave his pupil to find out for himself those rules of grammatical construction that regulate the language in which he would have him compose his theme? Would the knowledge of these laws—the enforcing on the young student such oft-tested rules, restrain the genius of the one, or prevent the other from expressing in clear language the results of his mental reflections or his perceptive faculties? or would not the powers of both be more free to exercise themselves, from a sense of mastery over all known means—the knowledge of the natural laws, and the best past ap-

plication of them to the practice of their particular art or science?

Such a practice, however, as the above, has been more or less followed in what were heretofore called Schools of Design; the hand and eye of the pupils received a careful training, but general rules or laws for the application of their skill were not afforded in the same degree: for (not to impugn the instruction of the able masters who have successively had the care of these schools), the regulation which confined the education more especially to one class (the artisans) had this necessary result. Such have neither time to remain to profit by more than the elementary teaching, nor position in society to enforce a better practice or sounder taste arising out of advanced instruction, even if imparted to them. Thus the general promulgation of well-defined principles has been wholly prevented. I say the general promulgation, as feeling that the laws and principles which connect art and taste are not to be communicated only to the students in our schools, but spread widely abroad: and if art is to be encouraged, (art, I mean, in its widest sense, as an universal pleasure-giver, a solace and delight, a refiner and purifier of mankind, as well as of great commercial value, and a source therefore of national wealth), then to have it justly estimated and sensibly cultivated, the principles which connect it with taste, beauty, and truth, should be disseminated through all ranks, and taught to all classes of the people. Such dissemination, then, becomes one of the first duties of the Department of Art.

It is not to be denied, however, that there are many by whom Art is thought to be a gift—given only to the few, and exercised by them empirically from innate

feeling and perception—feeling not requiring to be strengthened by scientific knowledge, or guided by any rules; which, indeed, they suppose rather to interfere with its exercise. These overlook the fact, that even peculiar gifts, or a peculiar organisation, may be improved; and that since no man's genius for Art is universal, it may be aided, strengthened, and perfected by a knowledge of the sciences which relate to that art—as for instance, the optical laws of colour, of perspective, and of form, with many others—in the same manner as the hand, by practice, becomes the obedient instrument and exponent of his mental gifts.

Moreover, it is not to be overlooked, that there are others who object to any general dissemination of principles to guide the taste of either the student, the manufacturer, or the public. Some regard the laying down of any kind of principles of taste as a tyrannical interference with trade and commerce; as a censorship, in fact, to be resisted as an oppression: they can see no security, that the criticism of a pattern will not eventually establish a censorship over the press; they think that, "the general public has a tolerable taste of its own, and that, in a commercial point of view, Fashion is the safest and truest arbiter." They consider "pure and perfect taste to be antagonistic to commerce," and sum up their views into the axiom, "That is best which sells best." "By this rule," say they, "a pattern or design is known to be good, bad or indifferent, only after those who are supposed to be the best judges of such things, namely, the purchasers, have approved or condemned it." Other objectors to the promulgation of any guiding principles relative to decorative taste, declaiming in the same strain, say, "There are no legitimate standards of taste or

design except the demands of the day;" at the same time, and with the same breath, allowing, that if any London tradesman were asked for an article of furniture in good taste, he would say, "I can make it for you, but it would not sell if I had it. I have no demand; it would not look the cost, like an over-decorated article." Even after such a declaration, we are told, in answer to, What ought the State to teach? "Simply drawing,—elementary and correct drawing: that," say they, "to do it well, will require all the art and taste the State can purchase." Another, who aims at confirming this, adds, "Never mind the colour,—any colour will do." As to any principles to be gathered or errors to be avoided by the study of the past, one objector says,—"We respect the past for its recollections of profit, or, it may be, of beauty; but the very worst thing we can do is to recur to it for imitation or copy:" whilst another, referring, it is true, to another branch of manufacture, would have us merely copy the past, and thinks want of originality the chief merit of a design; remarking, to bear out this assertion, that "an architect would be laughed at (or, at least, ought to be), who invented a new order of architecture." Now, one would hardly think it right to laugh at an attempt to invent a new order, unless the attempt was a very absurd one; but to laugh at one who really did invent a new order, would seem to imply that architecture was an exception to the law of progress.

Such are the varied objections made to the adoption of any principles of taste, derived either from the study of the past, the general laws of Nature, or the best practice of the moderns; and the poor public, as well as the anxious designer and teacher, amid such contradictory dicta, may well feel in the condition of the

painter who exposed his picture in the market-place for criticism. Although most desirous to win our way to the convictions of all by the truth of the doctrines taught, it is not our business to answer individual objectors, and, least of all, those who would place the shifting anomalies of Fashion as the fixed standard of taste, and test truth and beauty by a price-current. It is, certainly, not very surprising, after such contradictory arguments and such varied objections, to find the learned and scientific President of the British Association, in his address to the meeting of that body just held at Hull, lamenting the want of knowledge of the scientific principles of their profession, evident in too many of our artists, and urging on the New Department the remedy of this defect. "We may hope," says he, "that those whose duty it will be to give effect to this impulse" (the impulse arising from the Exhibition of 1851), "will feel the importance of the education in Science as united with education in Art. I trust," he continues, "that the better education, which is now so universally recognised as essential to preserve our future pre-eminence as a manufacturing nation, will have its foundations laid—not in the superficial teaching, which aims only at communicating a few curious results, but in sound teaching of the fundamental and elementary principles of Science: Art ought, assuredly, to rest on the principles of Science;" and after showing the value of scientific principles as guides to the artist, he concludes with hoping that the directors of the important educational movement which is now commencing with reference to educational objects, will feel the necessity of laying a foundation, not in complicated details, but in simple and elementary *principles*, which may place the student in a position to cultivate after-

wards, by his own exertions, a more matured acquaintance with those particular branches of Science or Art which may be more immediately related to his especial avocations. With such advocacy for the inculcation of sound fundamental truths, both in Art and Science, responded to as it was by so highly-cultivated an audience, we might pass by the objections before recapitulated, as well as those of others, who, lest the invention of the pupil should be narrowed, or his genius cramped, would have the teacher communicate no principles of Art to the student, and, disregarding the stores of past knowledge, would leave him to gather entirely for himself. The New Department of Art, at its very formation, felt and entered upon the duty of promulgating sound canons of design, either gathered from the finest works of the past, or judged to be in accordance with the laws of beauty, nature, and truth. It was hardly to be expected that any principles so propounded would be received at once, and without question; nor was it even to be desired: but the very discussion of such matters, if carried on with a generous spirit, and a sincere wish to arrive at what is sound and correct in taste, is calculated to do good; and so far the Department, even in the very opposition it has called forth, has much reason for congratulation. A spirit of inquiry must precede a spirit of belief; some points of doctrine may be modified; many will, doubtless, be established by discussion; and a search after truth must, in the end, obtain many converts, both from error, from ignorance, and from apathy. It is our office to keep in the van of the public, and to stimulate the research both of those who object as well as of those who assent to our teaching. In this opening address, therefore, I have aimed at showing as regards some of those principles for

the application of Art to Manufacture which have been most dissented from,—that they are not merely dogmatic, but reasonable and consistent in themselves, and supported both by the analogy of other arts, the natural laws, and the necessities of manufacture. Of these general principles governing the application of Decora tive Art to Manufacture, the two following have been more particularly objected to: — First, that which says, "That ornament does not consist in the mere imitation of natural objects, but rather in the adaptation of their peculiar beauties of form or colour to decorative purposes, controlled by the nature of the material to be decorated, the laws of Art, 'and the necessities of Manufacture;'" and, secondly, that "Ornament requires a specific adaptation to the material in which it is to be wrought, or to which it is to be applied: from which cause, the ornament of one fabric or material is rarely suitable to another without proper re-adaptation."

These two propositions more or less affect many of the others, and a proper examination into their justice and propriety will help to support the lesser truths by which they are surrounded. At the threshold of the subject lies the question, — What is the nature of Artistic Imitation, and what its extent and limitation?

Now, notwithstanding all the ridiculous legends which the ignorant believe to be the gospel of Art, from the Greek bird which pecked at the painted grapes, downwards, it may unhesitatingly be said that imitation, when relied upon for itself, is but a very low merit in the artist. I will not trouble you with quoting a host of opinions to this effect from high authorities, which might be found as plentiful as birds in summer, but endeavour to bring you to the same conclusion for

yourselves. Let us examine the question as it relates to Sculpture, the most real and tangible of the Fine Arts, as dealing both with form and substance, and not necessarily devoid of colour also. Has an attempt, merely to imitate Nature, ever been a received principle of this art? — or, rather, is not the reverse the case? Does not the sculptor purposely avoid individual imitation, and seek that characteristic generalisation which will best embody those high qualities of his art which make it truly ideal? Does he not, moreover, consider the nature and powers of his material, whether marble, wood, or metal, and wisely change, or, so to speak, conventionalise those parts which he cannot render literally? Look at the works of the great Greek artists in our noble collection at the British Museum, and which, I may incidentally remark, are not only works of the highest art, but evidence at the same time how much the laws of ornament ruled the practice of the sculptor when his art was applied to decorative purposes. Do we really find these works imitative? Not so. The forms are noted as selected from the many to express the one. The draperies are cast, not to imitate the clothes worn at that period (for it is well known to all sculptors that no fabric could cling to the limbs as does, for instance, the drapery of the beautiful group of the Fates), it is intended simply to display the form. Sculptors have said that these draperies are studied from wetted linen; but, whether so or not, the intention was to render the imitation of drapery perfectly subordinate to the expression of form. To show at the same time their ornamental knowledge, and the secondary rank in which they placed imitation, look at that marvellous procession which moved round the interior of the temple, and see how all things, the

human form, that paramount object of the sculptor as an artist, the forms of animals, far from being merely imitative, are entirely changed from their true relative proportions — the laws of distance disregarded — the treatment of draperies conventionalised, to suit the processional character, the ornamental composition, and the permitted space; the relief, moreover, being studied with the nicest perception of the relative position of the work to the light and to the decorative arrangement of the details. But, to pass from this, let me remark, that if the art of the sculptor consisted in the mere imitation of Nature, a cast from a beautiful human form would rival or excel the highest effort of the chisel. Some of you have doubtless seen busts cast for the purposes of phrenological examination; these are, of course, more literal or exact imitations than the portrait bust of the sculptor; will any one say that they are for a moment to be considered works of art? Nay, may we not go further and say, if literal imitation is fine art, then we ought to give the highest praise to the wax figures of Madame Tussaud's exhibition, which certainly are nearer imitations of individuals, heroic or noted, than the rarest bust or most poetic statue, especially when draped, as we are told the wax figures are, in closest imitation of the living original. It is true that these are two extremes; but the forgetfulness of a great truth, that in Art imitation must not be confounded with the idea of deception, leads to errors, which are near akin to placing the wax figure on a level with the efforts of the true sculptor. But it may be said, that Sculpture is too abstract an art to reason the question upon: let us turn, then, to Painting. Does the portrait painter, for instance, whose business it is, if of any artist, to imitate the individual, does he pride himself on a per-

fect imitation of Nature? Not so. The true artist desires not that his portrait should be a literal copy, such as the sun burns on the iodised paper, but generalises his imitation of the minor and individual details, and seeks rather to inform it with those characterising traits which at once portray the exterior person and the inner man: else were Titian inferior to Denner, and our own great portrait painter, Sir Joshua Reynolds, must rank low in art. If the head of the portrait is thus treated, the accessories of the picture are still more subordinated to the general effect. The dress must not obtrude its finery, but be sacrificed to the head, the principal object; and is to be expressed rather than imitated. Indeed, it may be said in Art, that imitation is always wrong and out of place when it disturbs the mind from dwelling on the general idea, or on that idea which is sought to be impressed on the spectator. Does this view imply any neglect of the study of Nature? By no means; since it is a much higher thing to study Nature with a view to give its fullest general character, than slavishly to imitate unimportant details: as much higher, indeed, as is that study which enables a man to arrive at a general law of truth, rather than to describe an individual and unconnected fact.

Moreover, each art has its own mode of imitating Nature; its own mode of seizing on those details which, consistently with the materials and means at command, may become the fullest exponents of the artist's mind. And so peculiar to each art is its own mode of imitation, that the professor of one art does ill study Nature who studies her not directly but through the medium of another art; since certain of the facts of nature are by each art forced into fuller view, and others scumbled over, as a painter would say, or not defined; and since

these points of expression and of suppression are diverse in different arts, one may not be studied through the other. Thus, for instance, the painter who studies his art through the stage, is apt to exaggerate the actions of his figures, and to force them into undue prominency, since the limbs on the stage must do what the features of the face do for the painter; and a certain violence of gesture, contortion of feature, and affectation of pose, is called for by the elevation of voice necessary to be heard, and the gesticulation which is required to impress the far-removed audience. And here I may say a word on what I before alluded to, viz. that imitation in Art must not be confused with the idea of deception; since it is too often the intervention of this false idea, connected with imitation, that leads to errors in our judgment of art. Thus in Histrionic Art, which allows the nearest approach to reality and deception—since men—living, moving men—are the actors, and all the accessories are, in a degree, real to make the effect apparently illusory—the spectator is never for a moment supposed to believe the tragic tale a present fact, or intense pain rather than a pleasing emotion would be the certain result. So also the writer, who cumulates his painful details in some work of fiction, moves our feelings into tears in sympathy with his creations; feelings that are not the less vivid because we do not for a moment imagine the relation a reality. Or take the case of the mimic, who amuses us and calls forth our laughter by recalling peculiar traits in the character or habits of others—traits, be it observed, in themselves often painful or disagreeable, and which in the original would be most likely to annoy or disgust us; here, at least, pleasure is not derived from deceptive imitation. And it is equally so with the painter's art; the ignorant

vulgar dwell only on his figures being so real that "they seem ready to walk out of the canvass," which to the artist's mind is praise nearly as complimentary as the bird and grapes before alluded to, and is akin to that marvellous fly which one old painter was always painting on the work of another, who, in his turn, was as constantly deceived and shamed into modesty and acknowledged inferiority by his attempt to remove it. Such, indeed, is the clay of Art, and not its spirit. "Deception," says Sir Joshua Reynolds, "which is so often recommended by writers on the theory of painting, instead of advancing the art, is in reality carrying it back to its infant state. The first essays of painting were certainly nothing but mere imitation of individual objects; and when this amounted to deception, the artist had accomplished his purpose." Is it too much to infer, therefore, that mere imitation can hardly be called art, since it is but the first lesson of the pupil, the first effort of the tyro, and must give place to the first impulse of truly poetic imagination which rises in the artist's soul?

But why weary you with these particulars? Simply to show you that in fine art even, where the artist is least limited by his materials, and the means of exact or literal imitation more in his power, such imitation is not sought for, but rather imitation subservient to other and higher requirements of his art, and subsidiary to the materials in which that art is to be embodied. And is it too much to say that in Ornamental Art, an art allied to manufacture, trammelled as it often is by the means of reproduction—consisting also in most cases of constant and closely-recurring repetitions, and where, moreover, the intention is limited simply to the beautiful decoration of surfaces, merely to the agreeable

distribution of form and colour, without any necessary reference to the imitation of natural objects;—that natural forms used for such purposes should be rendered rather in accordance with the requirements of the manufacturer, than the pictorial imitation of the painter? Conventionalised, as it has been called, rather than exactly imitated; that is, treated in subservience to the nature of the surface of the material to be enriched, and the laws of distribution of form and colour likely to effect such ornamental enrichment, rather than in reference to any accidents of position, of growth, or of place, which make them subjects for the painter's art, but are not necessary to the decorator.

Conventionalised—the word may not perhaps be a good one, and has been used and retained in default of a better; the idea intended to be expressed is, a mode of imitating natural objects, with a view to the necessities of the art or the means of manufacture by which the representation is to be reproduced.

Having already shown that neither deceptive imitation nor literal imitation is considered a high quality in the fine arts, it is desirable to examine how far such imitation is either possible or desirable in art applied to manufacture.

No one, it is presumed, will deny that imitation requires some adaptation to the end sought, and is greatly limited by the means; that, for instance, while it may be nearly literal or exact in some cases, it must be much modified or conventionalised in others. Thus in applied art, a flower in all its relief, in all its colour, in its texture and transparency, may be literally imitated by the artificial flower-maker; he may even add its perfume: but imitation of this nature, or to this extent, is immediately limited by the means in other fabrics or

materials. Thus in carving in wood, for instance, the transparency of the petals or leaves cannot be imitated, nor even their thinness; and their colour, if at all, only very imperfectly. The extent to which we should endeavour to carry imitation is, therefore, an important question. Would any one, for instance, propose to the skilful wood-carver to paint the beautiful work of his hands the colour of the various objects introduced into his groups? Think, for a moment, of Grinling Gibbons done into apple-green and peach colour! Or, you who recollect the noble carved sideboard by Fourdinois, which was exhibited in the French court of the Great Exhibition, imagine it painted, the four statues representing the four quarters of the world coloured after life, with a copper-coloured American, an ebon Indian, and a tawny Moor. The flowers, fruits, fish, and game, the very tints of Nature! Why, the black boy at the ragman's door, or the kilted Scot at the snuff-shop, is the state this noble work might be reduced to by such a process, although there can be no doubt that the mere imitation of the several objects would be more literal. Such barbarism, however, would at once reduce wood-carving far below the rank of putty work and few would wish so to deface the labours of the carver, or indeed to see them in any other state than that of the natural material wrought on. But to our argument: Would any one say that the art of wood-carving, with its less amount of imitation, is therefore an inferior one to artificial flower-making? Nay, but the very reverse; as is, indeed, implied in the terms by which they are severally designated—the one, wood-carving, being an art; the other an artifice, or attempted deception. It would seem, therefore, that deceptive imitation lowers the art in ornamental, as well as in fine

art, and that such a degree of imitation should be sought for by the artist as will give the most characteristic resemblance, the fullest expression, of the object imitated, having in view the material in which the imitation is to be wrought, the means at command to reproduce such imitation, and the specific purpose to which it is to be applied.

But here we arrive at another condition of the question, viz. the purpose to which the art-product is intended to be applied. Thus, in the case of carving, it will be evident to any one that a mere piece of carving in wood or stone may, as a *tour de force*,—as a piece of curious workmanship or handicraft dexterity, as an ornament, or even as a work of art, be curiously and imitatively executed, in a manner which would be out of place and inconsistent as a portion of the architectural ornament of a building. As a detail of architecture, the object imitated subserves a new art, and must be subject to the laws and requirements of that art; as, for instance, its projections and the relief of its various parts must be regulated by a definite impost: it must submit to the laws of symmetrical arrangement and the constant recurrence of the same form. These laws, as is the case in the refined art of Greece, may be rigid in the extreme, as is seen in the anthemion which decorates their friezes, or the echinus which enriches their mouldings; these—perhaps, the honeysuckle and the chestnut of nature—are so changed—so conventionalised in their application, that their origin may well be open to doubt; whilst even the festoons of flowers of Roman architecture, if less refined, less subdued to the laws of Art, are still amenable to them, and are less imitated than regulated by these definitive requirements. In either case, the subordination on these two points

must be allowed, first, to the powers of the material, and, secondly, to the purpose to which the art is to be applied; and allowing these two, exact imitation is impossible, and the question then becomes one of degree only, and may, when symbolism is not a consideration, resolve itself into that mode of imitation in which an ornamental expression of the object is to be obtained most suitable to material and uses.

Let us take the application of Art more peculiarly to manufacture by machinery; say that of calico-printing. In this instance, also, the precise imitation of natural objects is impossible, since relief is unattainable, although the appearance of relief may be given by light, shade, perspective, and colour. But is the mode or degree of imitation peculiar to the artist flower-painter that which is most suitable or conducive to the desired end? In the first place, the processes of production control the application of colour, which must be laid on in separate and unblended masses, by means of machinery, and not by that curious and delicate instrument the human hand, while the several tints also must be applied by successive and distinct processes; so that it would seem scarcely possible that calico-printing could compete with the imitative means at the disposal of the flower-painter. Let us, however, allow, that by improved mechanical and scientific aids the imitation of flowers, foliage, or other natural objects in light, shadow, growth, colour, and relief, could be rendered as perfect by machinery as it is by a Van Huysam or David Seghers; still the art is to be applied to a specific use, and not to be examined as a picture is. The fabric on which the painting is to be impressed is partly transparent, and the forms are at once blurred and indistinct; the garment it is intended to be made

into is to hang full and in folds; thus the light, shade, and the very forms of the object which has been imitated, are confused and hidden, and that *imitation* which the manufacturer had been at such pains to produce is entirely lost and destroyed. The garment moves with every motion of the wearer, and any examination of this rare art, as we are enabled to examine the painter's work, is, in the use of the material, as impossible as it is undesirable. Printing again necessitates a constant repetition of the same details; and what would be said of the painter who, instead of a rare flower or group of flowers, offered for our admiration a dozen or a hundred of the same monotonous form, the same unvaried colour, the same tedious arrangement of imitation? if the painter's imitation is sought for by the calico-printer;—let at least each flower, each sprig, each group, be varied and different. But, no; such is not the end in view: it is not to imitate the painter, it is not to attempt to vie with Nature, that is the true aim of the calico-printer; the legitimate art to be applied to such fabrics is at once seen to be simply to decorate or enrich the surface with agreeable forms and colours, and if for this purpose we use the beautiful forms and colours of natural objects, we must use them consistently with the true use and purpose of the material and the means at our command to produce the effect sought for. As the machinery by which the art is reproduced acts by a constant repetition, a geometrical distribution of forms is more or less a necessity which cannot be overcome. As the tints must be laid on separately and successively, and cannot be softened or blended, the simplest combination of tints and colours must be sought for rather than the more intricate; a circumstance also called for by the market offered for such goods.

If varied hues of colour are introduced, to be agreeable to the eye, colour must be distributed according to fixed laws of quantity and juxtaposition; which is scarcely attainable by that mode of imitation which is called naturalistic, but which lends itself readily to that symmetrical and regular display of the plant which is called a conventional treatment. This it is quite possible to show, is consistent with the natural laws of the growth of plants, and with that simple impression which in their natural state of growth they make on the casual observer, both of which I shall again revert to.

As to another printed fabric, paper-hangings, one of those who object to the principles laid down for the application of ornament to paper-hangings, asks, "Why lithochrome—every day reaching perfection and rendering Turner's pictures—may not become before long the means of giving wall decoration" (the term being evidently used for paper-hangings, since the rules laid down to which objection is made are specially confined to these fabrics,) "of a more finished and, thank God! of a far more moral character than those of Pompeii, I do not see." To which it may be replied, that it cannot be desirable to repeat even Turner's pictures, however beautifully rendered, over cottage-walls, fitting them into corners, and round chimneypieces and windows, and cutting them to lengths and widths, as it is said a former Emperor of all the Russias did at the Hermitage with some of the finest pictures of the old masters from the Houghton Collection. To be seen with pleasure, such works must be considered as pictures; whether repetitions of the poetic landscapes of Turner, or the Scripture lessons of Raphaelle, they should at least not be in close juxtaposition, but be enclosed, isolated, and surrounded, if with a surface decorated at all,

with one which is quiet, unobtrusive, and giving repose and rest to the eye—if they are to be enjoyed either by the poor man in his cottage or the rich man in his hall; and it is this suitable treatment of the surface of the wall which is sought to be obtained by the principles laid down for the ornamentation of paper-hangings—the product of machinery—leaving the question of the decoration of walls and buildings, by the hand of the artist, to his own genius and his own resources. An examination of the examples of old times in our Museum, and the prints and drawings in our library, will show, that in the best periods of the art of all styles and in all nations these principles have been the rule, and a departure from them the exception—the bizarre productions of a passing fashion, as ephemeral as the whim that produced them—and the like fate will be the case with the lawless designs of our day when knowledge and scientific principles shall spread and be better understood.

It has been asserted, that by the course of instruction prescribed by the Department, and the principles of decoration taught, the study of Nature is ignored; and that, passing by the beautiful growth of the field, the forest, or the garden, we revert to the *hortus siccus*, whose flattened, bleached contents, are only to be used. It is presumed that the mode of imitating Nature here proposed, which is termed conventional imitation, and which has already been explained to you, supposes Nature "reduced to a form, bearing about the same relation to the reality as a hieroglyphic does to its original figure. For instance," (I am quoting the words of an objector,) "a rose is not to be exhibited with its rich, round, and luxurious form, nor with its delicate shadings of tint, but may be spread out flat

and square, in four curved leaves, with a point between every two, all of one uniform colour, the divisions being made by black lines;" but the students in these classes will not be taught so to treat Nature, but rather to study her works more lovingly, to examine them more patiently, than even the artist is called upon to do. The structure of the plant or flower is first carefully dissected and analysed—the component parts examined and sketched—the law of its growth ascertained, and the harmonious relations of its tints and colours carefully noted: nor are the graceful accidents of its growth—for accidents they are—neglected; and the designer having by these means obtained a complete knowledge of his subject, is enabled to arrive at the simplest mode of displaying it characteristically, and would be as little likely to put four leaves to his rose as to design one from the embalmed contents of a *hortus siccus*. Such studies, such investigation of the details of Nature, will enable him to give the fullest character of the flower or plant by the simplest elements of form and colour. He will learn, also, by such examination, that Nature is symmetrical in her works—or, to use the words of a distinguished botanist who has addressed you from this place, that "in all natural objects there exists a law of symmetry, which is characteristic of every form in which the organic world is seen;" that, in fact, Nature is governed by geometrical laws of developement, which, if Nature herself disturb by her various accidents, the artist may at least revert to with success when he has to submit the works of Nature to a purely artificial use and to an imitative reproduction by manufacturing processes. Nor does this prevent him, when the requisitions of production are not such as to preclude exact

imitation, from vieing even with the artist-painter in the imitation of the beautiful objects which Nature supplies; and in works of decorative art, where his hand is the only machine, to follow the examples of the great decorators of antiquity and of the Rénaissance. It may be remarked, however, that far less knowledge and power is implied in the perspective delineation of a plant, with all its graceful accidents of growth, than to ably and characteristically display that plant decoratively and perfectly as ornament. Thus hundreds of honeysuckles may have been treated, and ably treated, by the skill of the artist, but the beautiful curves—the exquisitely balanced quantities—the symmetrical arrangement of the anthemion, as decoratively treated by the Greeks — has been done but once, but that once has left it a form of beauty to endure for ever. Dr. Lindley, in his lecture in this place, speaking as a botanist, says :—"It is to be hoped that the time is approaching when good taste will shrink from huge bouquets hung upon curtains, carpets loaded with mountains of fruit, or muslin dresses made uncomfortable with eternal garlands of leaves and flowers, put in with a due regard to impossible perspective and incomprehensible light and shade. Refined taste," says he, "is shocked at such offences against common sense, and seeks eagerly for that which is beautiful without being ridiculous." In another place he says :—"If the nature of vegetation is rightly considered, a symmetrical arrangement is almost inevitable. Symmetry in plants arises out of their peculiar nature; it is dependent upon a highly-complicated internal structure, which is, in itself, essentially symmetrical. The basis from which organs proceed being symmetrical, it seems an evident inference that the organs themselves should be symmetrical also," and

that it is only "distortions and disturbances arising from peculiar growth, or accidental causes, which produce an apparent want of symmetry in plants." Professor Forbes, also, in his valuable lecture on Animal Forms, says:—"What, after all, are the harmonies and consistent laws, and admirable types, that are the chief aim of the naturalist to discover, but the laws of art that are in nature? The Creator of whom that beautiful is the thought, never works except in perfect truth. The laws of beauty that can be elicited from the study of His works must ever constitute the legitimate code for the artist. It is not through the *mere imitation of God's productions that we can hope to benefit and elevate art-labour*. Thus it is that Science becomes the handmaid, even as she is the sister of Art;" and when we find Science helping and confirming Art we surely may revert to those first laws of natural developement it points out to us, when such laws tend to obviate many difficulties which we have seen the literal imitation of accidental disturbances, arising from growth or culture, places in the way of the application of art to manufacture.

Having shown, as I promised to do, that the conventional treatment, or ornamental display of plants, is consistent with those laws which Science teaches us govern their developement, I would say a word or two on its agreement, in many respects, with that simple impression which flowers and foliage make on the casual and untaught observer in their natural state of growth. All who have attentively examined Nature for themselves, out of doors, in a sunny daylight, when the true beauty of flowers is most fully displayed, will be sensible that the general impression they make on the eye, apart from their close examination, is that of simple masses of form

and colour, with little perceptible light and shadow. I speak more particularly of simple and natural, rather than of cultivated and monstrous flowers. This arises partly from the dispersed light of day, and partly from the transparency of their petals permeated by light in every part. No doubt, on examination, there is light and shade, but it is far less apparent than might be supposed, and is quite subordinate to the general impression; and this is the case with leaves also. A leaf impresses the eye as a definite green form only — a flower, as a form of one or of combined colours; and as most flowers present their cups to the sun, the observer sees them rather in their true shape than in any perspective view of them: the crowfoot is a simple round blot of yellow; the daisy, a yellow circle surrounded by white; the rose, a yellow circle surrounded by pink. This explains the reason why a child, a peasant, or any uncultivated person, draws a flower geometrically rather than perspectively, in its true rather than its accidental form. Not, however, to lay too much stress upon this part of the subject, there is no doubt that flowers, in their natural habitat and natural growth, have been too little studied by the designer; he either looks through the eyes of the artist, and culls his groups from pictorial art without reference to nature, or his flowers are studied in the artificial light of rooms, where their full beauty is not seen, nor their true impression upon the eye rightly understood. From hence arises artificial grouping, coarse and violent shadows, and much of that pictorial rather than ornamental treatment, which is contrary to the laws of this art. It may possibly be urged, in respect to the literal imitation of flowers used as ornament, which is objected to in the teaching of this Department, that it is to a certain extent pleasing and beau-

tiful. This, it is said, is at once evident from the favour such imitations find in the eyes of the public, and that, on this account, it is hardly necessary to condemn them as false in principle, seeing that many persons evidently derive pleasure from them; but do we not often receive pleasure from things absurd and monstrous arising from mere novelty—absurdities, indeed, which we are astonished we could have ever tolerated, when the novelty that made them pleasing has passed away? Of this, Fashion, which has been set up as the "arbiter of taste," is a great proof: on any violent change of fashion taking place, we first laugh at the new absurdity; then, when it becomes generally adopted, we begin to think it elegant or becoming; and on the next violent change again look back upon it as an anomaly, or are inclined to think it ugly and monstrous. Besides, in giving instruction to students, it is necessary to avoid the beginning of error; since, if permitted at all, it often grows until it subverts truth. As an instance of this, let me show you the course of error arising from a small departure from one of the laws of ornament — the law of symmetrical or balanced quantities, ever present in the finest works of Greek and Roman art, and derived from them by the great artists of the Cinque Cento period. The principle began to be broken through in works of a trifling character, such as the designs for the illustrated margins of books; from this it passed to wall decoration; it was generally adopted into relief ornament; thence the transition to structural forms was easy and obvious; and this little departure from principle ended in the false and distorted construction, the coarse and overcharged ornament, known as the style of Louis Quinze. In the same way the permission of a departure from the proper mode of imitating natural objects—pic-

torial as distinguished from ornamental imitation—leads step by step away from true art, until it results in the false principles and extravagant productions; such as are too manifest in many works you see around you.

In commencing, I proposed to examine two of our propositions respecting the application of Decorative Art to Manufacture. It will be seen that the course of my argument has been directed at the same time to the support of both; since, having shown that the mode of imitating natural objects as ornament is subject to and regulated by materials and means, it is evident that it is improper, without due modification, to imitate the ornament of one material on another. Having already trespassed largely on your time, it would seem needless to enter further on the subject to point out the incongruity of producing the forms obligatory in weaving by printing, those proper to casting by carving, &c., much less to combat the impropriety of imitating the relief ornament of a marble frieze on the delicate tissue of a muslin curtain, or the moulded and projected compartments of a ceiling on a flat floor. After what has been already urged these anomalies may be left to speak for themselves, and I will conclude by slightly adverting to another class of objections which have been made to the teaching of this Department. It has been said to interfere with the liberty and interests of trade, and to force the production of such goods as are ruinous to the manufacturer. But the question is not at all a manufacturer's question,—it is a purely public one, and cannot act otherwise than legitimately upon manufacturers. We are as utterly unable, as we are wholly undesirous, of forcing our views upon either the designer, the manufacturer, or the public. As far as the first goes

—the designer—the endeavour is to give him the fullest possible instruction in all parts of his profession, —the fullest knowledge of what has been done by men of old, and acquaintance with the principles of science and art upon which their works have been executed, together with all modern improvements in science and manufacture, so that he may be well qualified to apply his knowledge either in the old paths or in new directions. Thus educated, thus prepared, the Department leaves him to be engaged by the manufacturer and his public, in the way most congenial to their wants and tastes. As to the manufacturer, it is utterly unable directly to influence him to produce a single piece of any fabric, except so far as its teaching acts upon the public to convince them of its rightness, soundness, and beautiful results, and thus re-acts upon the merchant and manufacturer by that most legitimate of all means—"the demands of the market." When the public demands a different art, when things sell that are in accordance with improved taste and sound teaching, the manufacturer will gladly produce them: until that time he will, no doubt, produce, not according to sound taste or to good taste, but simply what sells. With this there can be neither the wish nor the slightest power to interfere, except by that legitimate teaching which will raise the public taste, and with it the taste requirements, of the mass of our consumers, and prepare men qualified to gratify it; and although we never can subscribe to the maxim, that "the only legitimate standard of Taste is the demands of the market," there is no doubt that such is substantially the only legitimate source of production. Let not this, however, be supposed to interfere with the dissemination of a sounder and truer taste, referable to a less

variable standard, and which will raise our public in the scale of nations and the value of our manufactures in the civilised capitals of the world, enabling them to rank as high for beauty of design as they now deservedly do for all other manufacturing excellences. And, as conducive to this desirable end, we would invite both manufacturers and the public to our well-selected library of books, drawings, and prints, open to them at all times in the manner most conducive to its advantageous use; our schools and special classes for obtaining executive skill and practical teaching; and, lastly, to our increasing industrial museum, with its explanatory catalogue. By these means it is hoped that the desirable results we look forward to will be gradually, yet effectually, realised.

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THE SYMMETRY OF VEGETATION.

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THE

SYMMETRY OF VEGETATION;

AN OUTLINE

OF THE

PRINCIPLES TO BE OBSERVED IN THE DELINEATION OF PLANTS:

BEING

THE SUBSTANCE OF THREE LECTURES

DELIVERED TO

THE STUDENTS OF PRACTICAL ART, AT MARLBOROUGH HOUSE,

IN NOVEMBER, 1852.

BY

JOHN LINDLEY, PH.D. F.R.S.

(PUBLISHED BY AUTHORITY FOR THE DEPARTMENT OF SCIENCE AND ART.)

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LECTURE I.

1. THE representation of vegetable forms must always be considered from two different points of view, the actual and the conventional. Nor indeed is it ever expedient to confound them; for though the conventional is based upon the actual, they are in their nature entirely different.

2. I observe that some distinguished men who have previously addressed you in this theatre have expressed an opinion that "Flowers or other natural objects should not be used as ornament, but conventional representations founded upon them, sufficiently suggestive to convey the intended image to the mind, without destroying the unity of the object they are employed to decorate:" that "In surface decoration all lines should flow out of a parent stem, every ornament, however distant, being traceable to its branch and root;" and that, "beauty of form is produced by lines growing out one from another in gradual undulations, there being no excrescences."

3. At first sight it appears difficult to reconcile these statements with another well-known axiom, that "Whatever is beautiful is true;" or, if you please, that "Whatever is untrue is not beautiful;" because, if you are to represent natural objects in a conventional

manner, that representation cannot be absolutely true. It can only be an approximation to the truth, and the question is, What the nature of that approximation should be?

4. Although I make this remark, I do not dispute the propositions in question taken in a very general sense. I believe them to be perfectly just, and that three axioms were never proposed for the adoption of students more practical and well founded than they are; and I hope it will be found that, as I proceed, my remarks will bear upon these points sufficiently to prove their truth.

5. But what is truth? We say that what is true is beautiful; and what is beautiful is true; yet the great point remains to determine, in what truth consists? There cannot be a doubt that wherever we find that the truth has been absolutely represented, a certain amount of beauty is attached to the representation of it. But it does not follow that the greatest amount of beauty belongs to the most exact representation of an object. Much depends on the manner in which objects are combined. The truth as regards plants, and indeed all things, can only be really judged of by the eye of intelligence.

6. Two persons looking at the same object — one well informed and acquainted with the points which require to be observed, and the other with an uncultivated eye — regard the same thing with different powers of vision, although they both have the same object before them.

7. Other persons seeing all that intelligence can discover, misunderstand the object of their art, and notwithstanding their faithful adhesion to truth, produce the most disagreeable results.

8. Take the case of Bernard Palissy. He had a great reputation, and still has in the eyes of some. He was a man of whom it was said by Buffon that he was so great a naturalist as nature only could produce. Palissy himself describes the source of his fame by saying that he had had no other book than "the heavens and the earth, which are known of all men, and given to all men to be known and read." He was not Greek, he said, nor Hebrew, nor poet, nor rhetorician, but a simple artizan, poorly enough trained in letters. Yet what he, a simple artizan, might learn by putting himself to school with nature, he had come to consider as the highest learning. "You will say," he remarks, "that you must not take heed to my speaking, inasmuch as I am neither Greek nor Latin, and have never even seen the volumes of the doctors. To this I answer that the ancients were men like the moderns, and that they were quite as liable to be deceived as we are."

9. He therefore refused to recognise the "wisdom of his ancestors," and, turning away from books, he, to use his own words, "scratched in the earth for the space of some sixty years and upwards, and searched among the entrails of the same, in order to understand the things which she produces in herself." But look at the example in this museum of what he produced.

10. It cannot be denied that in the dish there preserved he has represented natural objects with very considerable truth, and that the objects have in themselves considerable beauty. No one can say that his lizard is not exceedingly like a lizard, or that the fish and other creatures belonging to the animal kingdom, are not skilful representations of objects

which Palissy had seen; but, can any one say that they and the dish together form a beautiful combination? We can hardly assert that a dish, an object to be used, on which lizards are sprawling, and crawfish crawling, with cowries round the borders, and all manner of living things moving about among them, can be a beautiful work of art. The things themselves are true and beautiful, but the combination is incongruous, and there is no beauty in the work as a whole. Now that is the point on which attention should be fixed. It is clear from such an example, that when we assert an object which is true to be beautiful, the assertion must be taken with a certain limitation. This point might be much enlarged upon.

11. In all natural objects there exists a law of symmetry, which is characteristic of every form in which the organic world is seen. It does not matter what we select. Take a horse. It is impossible not to see that there is the most perfect symmetry in his structure however inferior the breed to which he may belong. The two sides of the animal answer the one to the other. If you cut him in two, the halves are essentially the same; leg answers to leg, eye to eye, nostril to nostril, rib to rib, and, in the various veins and muscles, those of the one side correspond with those of the other, within certain limits. So again with birds; leg answers to leg, and wing to wing, and even feather to feather.

12. It may seem superfluous to mention this, and I only do so for the sake of indicating a universal law.

13. It is hardly necessary to observe that in the shells on Palissy's dish, where less perfect symmetry is observable, circumstances are not the same as in the instances already adduced; for a shell does not exactly

represent the structure of the mollusc which produces it, although moulded upon its surface, or formed from its secretions. It is wonderful, however, to see how near an approach to symmetry occurs in even inorganic matter when its form is determined by unconscious vital force. This is most especially conspicuous in the whole race of Corallines.

14. Symmetry may be defined to be the general correspondence of one half of a given object with the other half, in structure, or other perceptible circumstances; or the general correspondence of one side of an object with the opposite side, in structure, or other perceptible circumstances.

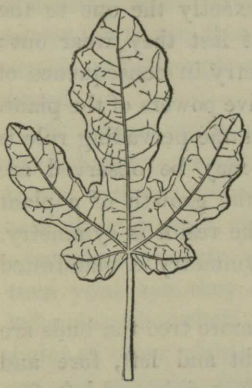
15. If understood in such a sense, all living objects whatever will be included under the denomination of symmetrical. That which we find universally in the animal kingdom, belongs to all parts of the living world, and must therefore occur equally in plants, however unlike animals they may be. The student's attention cannot be directed too closely to this important law, from which there is no real departure, except owing to accidents; such as those which produce monsters in objects with which we are most familiar. Indeed symmetry in plants arises out of their peculiar nature. It is dependent upon a highly complicated internal structure, which is in itself essentially symmetrical. The basis from which organs proceed being symmetrical, it seems to be an evident inference that the organs themselves should be symmetrical also. A few illustrations will render this sufficiently obvious.

16. Take a section of the stem of any palm tree; of the Sechelles Cocoa nut, for instance. It has a bark similar to what we are familiar with in other plants;

and immediately within it a harder and darker matter, which is tessellated, as if made up of minute fragments like mosaic. The little tessellations or black marks which constitute the dark stain that distinguishes this wood, are all curves, — dark curves, with certain holes or passages in their hollow. But the curious fact is this: the whole of the curves are placed in the same relation to the central part of the stem, their convexity being invariably directed to the circumference; and among the millions of little marks which form the natural structure of this plant, and represent its (internal) symmetry, every one is in the same relative position with respect to the centre. Beautiful patterns might indeed be made out of such bodies. The same thing occurs in the larger part of the order of Palm trees. I do not mean to say that there are no examples to the contrary; many disturbing causes indeed interfere with this arrangement; but if we can observe the curves in the position in which they were originally formed, the relation which they bear to each other is constant. Distortions and disturbances arise from peculiar growth or from accidental causes, which are without the pale of systematic inquiry, and not susceptible of being reduced to any fixed rule.

17. And so with regard to the veins of plants; they too are always distributed in an exactly symmetrical manner. Take any leaf. If we separate it from end to end (along the mid-rib), the one half bears a most striking resemblance to the other. On the one side the veins run to the right, on the other to the left: perhaps those to the right are a little above those to the left, in that case the difference is maintained throughout. If there are four ribs on the

one side, there are four on the other; and if you measure them off, provided the leaf has met with no accident, the one vein is as nearly as possible of the same size as the other. If you place the edges against each other, their little indentations will almost fit. In all plants there is the same remarkable correspondence between the opposite sides or the contiguous halves of the same leaf. More complicated examples are easily found. You have a leaf with fifteen divisions on each side—in all thirty. In all the contiguous divisions of the same leaf there will be thirty also. But the number may *diminish* to twenty; and then, if there are twenty on the one side there are twenty on the other, or it may be reduced to ten on the one side and then there will be ten on the other. In all such cases symmetry is in no degree impaired, whatever may be the amount of complication in the structure of the leaf. Nothing of this kind is more elaborate than what we find in tree Ferns. Myriads of minute divisions contribute to form the general leaf; of those divisions every one of the larger is exactly like its neighbour; they balance each other. As such leaves diminish in length, the size of their divisions also diminishes, and the parts belonging to the internal structure are also reduced in the same ratio; so that the symmetry or balance of parts is still maintained with much exactness.



LEAF OF THE FIG TREE.

18. Another leaf has certain projecting ribs: two lines of projections on each side of the mid-rib. Now those projections correspond exactly the one to the other, as far as they go. At last they wear out; but there is no loss of symmetry in consequence of diminished force in the formative powers of the plant.

19. Wherever we look the same pervading rule is found. Such exceptions as may be observed are apparent, not real. In fact the growth of a plant is a system of equipoise, and the result is symmetry. The way however in which symmetry is manifested much varies.

20. In the branch of a sycamore tree the buds are formed in opposite pairs, right and left, fore and aft,—right and left, fore and aft,—and so on; and such is the constant rule, any apparent departure arising from accidents to which plants are peculiarly subject, but which ought no more to be taken into account in considering what nature intends, than the occasional mutilations by which the human frame is disfigured.

SYCAMORE. LINDEN.

21. In another tree, the Linden for example, symmetry is displayed in a different way. The buds are no longer opposite, but alternate; one on the left, another on the right, and so on, right

and left alternately, and at equally increasing or diminishing distances. Any one in the habit of examining what purport to be drawings of plants, cannot fail to see that this fact is seldom sufficiently considered, although essential if truth is to be represented.

22. Leaves again, with reference to their position on the branch, present the same regularity as the buds. In the common Olive the leaves are placed opposite each other in pairs, right and left, and fore and aft, —a pair and a pair, a pair and a pair; wherever you turn your eye they are still in opposite pairs, one balancing the other. In an Alaternus, and in multitudes of other plants, the leaves (like the branches) are not opposite, but placed alternately, one above the other, from one end of the branch to the other, and either equidistant, or at equally increasing and diminishing distances.

23. As vegetation ceases or begins to diminish, the distances between the leaves diminish also, still, however, in regular proportion and at a regular rate, until the entire stoppage of growth is effected. The same thing happens when leaves begin to grow; they are at first very near each other, then their distance increases till its maximum is reached. Equidistance continues for a certain length of time; but at last growth slackens, and the distance from leaf to leaf gradually diminishes.

24. However confused the arrangement of leaves may at first sight appear, it will always be found that this is the law which governs their production.

25. What is true of leaves is equally true of their veins, as has been already stated. Venation is perfectly symmetrical, the veins balancing each other on the two sides of the leaf.

26. Not only do the two sides of a leaf balance, but the veins of every leaf on the same plant are formed on the same uniform plan; however great the number of leaves, the veins are developed in the same manner in every instance.

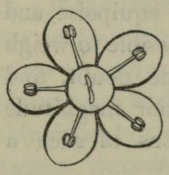
27. It is a great mistake not to look attentively to this point, when the object of the artist is to obtain designs for flat decoration. It is difficult to conceive anything so beautiful as the tracery of veins — their graceful curves and the exact relation they bear to each other, stopping here, expanding there, infinitely varied and nevertheless producing a whole in which there is not the least loss of balance or essential symmetry.

28. It has thus been shown that a plant consists of a centre or branch, on which certain bodies, buds, or leaves, are placed in a symmetrical manner; that all the component parts of those bodies are again placed in a perfectly regular and symmetrical position with respect to each other, one part growing out of another according to certain fixed laws which no natural circumstances can alter.

29. The same principles are manifest among flowers. A flower is a body in which that system of equipoise, of which symmetry is the great result, is as clearly traceable as in branches or leaves, or in the veins of leaves. Either one-half of a flower balances the other, or one series of organs alternates with another, or any deviation from symmetry that occurs in one part is immediately compensated for by some peculiar development specially provided in another part.

30. Take a blossom of the common Goosefoot (*Chenopodium*). It consists of five slender arms or sta-

mens, which are all exactly alike, and opposite which are five other external parts, forming a star with five rays, the two series corresponding precisely the one with the other.* This is one of the simplest of known forms: should a flower be reduced much lower, there is scarcely room for the manifestation of special symmetry.



FLOWER OF GOOSEFOOT.

31. The most complicated structures are merely different in degree. In the Rose, in the Crowfoot, in the Magnolia, or in the Water-lily itself, the same class of facts pervades the organisation. Among those plants in which augmented number produces a very complex condition is the *Verticord.* In this flower we have five fringed bodies on the outside of the whole; those bodies consist each of five arms, of which the left and right external arms correspond with each other, and the second inner left corresponds with the second inner right arm; so that we begin with a structure of five parts, each of which is subdivided into five others. In the next place five more parts are placed within and between the first, as if to insure the requisite balance. Then come ten (twice five) other bodies (scales), which stand, five opposite and five between the second series of five. Finally, we have ten other parts (twice five again), completing the symmetry of the whole structure, and alternating with the ten

FLOWER OF VERTICORD.

* Its numerical structure is 5 + 5.

scales which preceded them; the whole presenting a striking example of the way in which, in a complicated structure, the principles of equipoise and symmetry are maintained. Were it possible to weigh the corresponding parts we should, no doubt, find their weights the same as well as their magnitude and form. The numerical proportions of such a flower are $(5 \times 5)+5+(5 \times 2)+(5 \times 2)$.

32. The red Brugmansia offers an instance of a more simple arrangement. In this flower we do not at first perceive any symmetry except that the end of the long tubular corolla is divided into five equal lobes, which, if they had been formed by rule and compass, could not be more exactly alike. On the outside of this corolla, upon each of its five lobes are three ribs, in all fifteen, or 5×3; and this plant never produces any other number. Upon opening it we find the same number, five, still prevalent in the stamens; and the external cup or calyx is also in reality divided into five triangular teeth, although, owing to the way in which the teeth adhere, this is not at first sight apparent. The fundamental number still being five, this structure is represented by $5+(5 \times 3)+5$.

33. All these remarkable examples of floral symmetry seem to show that there is a centrifugal force operating in the formation of flowers, which, being equal in all directions, can scarcely fail to produce such a result.

34. In the ripe fruit of the apple, no symmetrical arrangement of parts is at first apparent; but it once had a perfectly regular structure, in which all the parts were exactly balanced, and even when ripe its symmetry is visible to the eye of intelligence.

At its end will be found five-points, which represent the five external divisions that originally belonged to it. If the fruit is cut across, the five-pointed star in the centre indicates the symmetrical number of the apple to be five. If we count the parts in the apple blossom we find five outer divisions in its calyx; five thin delicate plates next succeed as the corolla; then twenty threads for the stamens; and, finally, five other central points or arms complete the structure; all equal and alike in each series, all placed in a certain fixed relation to each other round a common centre, which itself corresponds with the surrounding organs. This structure is $5+5+(5\times4)+5$.

35. In an ear of corn the same kind of symmetry exists, although more difficult to discover. Each grain stands in perfectly symmetrical relation to the others: one right, one left; each a little higher than the preceding. Even the small scales of chaff which enclose the grains, are placed in an equally symmetrical position with respect to each other. The demonstration of this, however, involves minute details, which need not be entered upon at present. When properly understood it assists in further proving that symmetry is a fundamental law in plants, and that the most dissimilar forms of vegetation obey that law.

36. It is not merely in the higher orders of plants that this symmetry occurs. It equally pervades the lowest. Let the student take for example an *Agaricus* or Toadstool; in this plant, low as it is in the scale of development, symmetry is as much observable as in other species. The Toadstool was originally a sphere. In time it loses that shape but preserves concentricity of outline, and as it does so, organises itself, producing vertical plates. And how

are these plates arranged? It is impossible by any amount of ingenuity to arrange a greater number of such plates symmetrically in the same area. In the first place they radiate from the centre to the circumference; then others are interposed in exact numerical proportions, not touching the circumference; and from this others are finally so directed inwards as to fill every vacant space. We see here a repetition of figures as regular as if they were described by the rule and compasses, and the result is exquisite beauty. Take the half-transparent Campanulate Agaric; observe the mode in which its rays are arranged, and with what admirable symmetry they dovetail into each other. More regular figures cannot be described, and yet they are somewhat different in each kind of Agaric. In a basketful of such funguses, no two species are quite alike, but they agree in being all symmetrical, and eminently beautiful in the arrangement of their parts.

37. Fungi of a much more simple structure continue to illustrate the same fact. There is a fungus called *Sphœria militaris*. In the West Indies is found a great wasp-like insect called a *Polistes*. Out of this grows the fungus which destroys the creature, vulgarly named a Vegetable Wasp. If we observe, first, the shape of the fungus, and then examine its section, we find it covered by equidistant holes, which indicate the places whence the seed proceeds. Every hole represents the mouth of a cavity, all the cavities are arranged round a common centre, are all directed upwards at a particular angle, and are so placed between each other that no one of them interferes with its neighbour, but each balances some corresponding cavity opposed to it.

38. We see the same thing in the common fairy ring,—those rings which we so well know, and which we find in meadows in the country. A fairy ring has a centre, round which there is a circle formed by the Toadstools belonging to it; first, one circle is formed, and then another. The reason is this,—that the seed of the original fungus was *once* a point, from which when it began to grow, threads radiated regularly by virtue of the centrifugal force of organisation already spoken of. The circumference of the organic circle thus formed is alone capable of producing Toadstools, and it continues to do so, as it produces ring beyond ring; until natural obstacles put a stop to the regularity of formation.

39. The toadstool is very low in the scale of organisation, but others equally imperfect still obey the laws of symmetry.

40. We all know what Lichens are — that they form an inferior order of vegetation, in which we usually recognise neither beauty or symmetry. But in some cases they form a succession of cavities, so placed one within the other that we might almost, with a series of cups divided into lobes, form such lichens artificially. The flat lichens indicate the same symmetry, although in a somewhat different manner. They generally appear as a confused mass spread upon a stone or tree, but the intelligent observer sees that they too spread in the beginning equally round an original centre; that lobe balances lobe, and ramification ramification: equipoise and symmetry manifesting themselves every where. The reason why the natural beauty of their arrangement is so seldom observed is, that such plants are peculiarly liable to injury. Stones crush them, men tread on them,

animals bite them, and thus they lose their natural forms.

41. Even in the meanest water plants symmetry is still found. The Thorea, which is closely related to a sea-weed, although not strictly one, may be perhaps fished up out of the Thames. In that plant, each little branch is furnished with arms exactly ordered, those on one side answering to others on the opposite side. From its original point of growth it describes a regular figure whilst floating undisturbed, although the accidents to which such plants are subject soon destroy all appearance of equipoise and symmetry. And so it is with the real sea-weeds and all the plants akin to them. From an original centre arms are regularly formed, so that if one leg of a pair of compasses were placed upon that centre, the ends of the arms would all be struck with the opposite leg. In general this is not observed because of the mutilation they undergo when thrown upon the coast; and by reason of other causes which destroy their natural symmetry. But the truth becomes evident when sought with sufficient care.

42. Thus we see that a system of equipoise, to be regarded as the manifestation of a centrifugal vital force, exerted in every direction equally, is discoverable throughout the vegetable kingdom in all its parts. That apparent exceptions to it occur, is not to be denied, but they are merely apparent, as can be easily demonstrated.

43. If there be any real exception to this universal symmetry, it is in the colours of plants. I understand that Mr. Ruskin declares colour and form to have no connection. In the case of animals I do not question the assertion. It is for zoologists to say

whether it is true or not. But the proposition must be received with considerable limitation if we look to plants. Colour very often has, in plants, an unmistakeable connection with form. In fact, the nature of plants renders it inevitable. Colour in plants,—especially the variegations of colour, mottlings, markings, and blotches, are generally produced by the action of some substance introduced into the system of an organ by its veins. The veins are symmetrical, and the matter introduced through them, acting in the vicinity of the veins, discharges colour. The colour therefore has some relation to the veins, and therefore must be symmetrical.

44. Of this truth endless examples meet us at every step. Any one may procure a piece of the variegated Aloe leaf, in which veins run parallel to each other, from the base to the apex. These veins, towards the margin, appear to have the power of discharging the green colour, and thus the variegation of the Aloe runs in streaks following its symmetrical veins.

45. In the reticulated Amaryllis the leaf is always white in the centre; the matter which has the property of discharging colour is confined to the middle mid-rib, and cannot get beyond it.

46. But we need not visit hot-houses to see evidence of this. The variegated Kail, to be found in any cottager's garden, proves the case as well as the most precious production of the tropics. In that plant it is manifest that the red, the white, the yellow, the other tints which harmonise so charmingly with the natural green of the leaf, are each dependent upon the veins, the universal symmetry of which has been so often pointed out.

47. At the same time it must be admitted that there

are cases in which we cannot reconcile the blotches found in plants with any thing like symmetrical arrangement; but these are exceptions, not the rule; are probably caused by the colours, dependent upon veins, being accidentally blended; and upon the whole it is safer to assume in all cases that varieties of colour have really some fixed relation to the veins of the parts in which they occur than to regard them as vague and accidental. So that, notwithstanding Mr. Ruskin's great authority, I think his statement is not borne out by what we know of plants.

LECTURE II.

48. But it is time to turn from general considerations to some of the details upon which they are founded.

49. If the nature of vegetation is rightly considered, a symmetrical arrangement is almost inevitable; for what is a plant in the beginning? If we take it at the earliest period in which its existence can be discovered, it is found to be a point, whatever magnitude it may ultimately acquire; that point gradually becomes a sphere, so that it would not be inaccurate to represent the birth of vegetation by a circle. Up to a certain time there is a force acting from the centre to the circumference of this sphere; but after a time the sphere acquires polarity — that is to say, its poles lengthen, and thus we have either a cylinder or a double cone.

50. Such is an abstract notion of a plant. As soon as this extension upwards and downwards occurs, the tendency to assume a spherical form disappears, or becomes so disguised that it is difficult to recognise. The force of development then expends itself in a somewhat centrifugal manner, operating in planes at a short distance from the axis of the stem or main body whence it proceeds.

51. Eventually the results of this manner of growth become visible in a successive formation of parts,

each upon the model of the previous parts; various bodies being thus produced, possessing different characteristics, but all reducible to the same general law.

52. The root appears to be an exception to the ordinary rule; but it seldom enters into the consideration of artists. Its incipient formation is not however at variance with the foregoing general statement. A root is at first a cone, producing regularly from its sides certain arms or threads, spreading equally in all directions. But in consequence of the resisting medium in which a root grows, symmetrical development is soon interfered with. The soil is not like air; and the parts produced in it are impeded by the obstacles they encounter, or injured by insects and accidents, and thus the regular arrangement which constitutes the beauty of vegetation does not appear to occur in subterranean organs. But if roots grew in fluid they would obey the general law, as a simple experiment will show. If an acorn is passed through a card fixed in the neck of a glass filled with water, the card being merely to keep the acorn steady, and if the point of the acorn touches the water, the root will be found as it grows downwards to arrange itself in quite as symmetrical a manner as the parts of a stem.

53. The first circumstance to be noted in the stem of a plant is, that it always in the beginning, and usually at all times, is either a cone or a cylinder. In the majority of the cases with which artists have to deal, a stem is a cone, diminishing very gradually — almost insensibly — from its base upwards. In the oak, notwithstanding its huge bulk, this may be traced; the ramifications become gradually smaller, and almost end in vanishing points, so that however

much the form of a cone is lost sight of, it is still distinctly traceable.

54. In bushes and plants of a similar growth the conical figure is too manifest to require demonstration; their branches, however much extended, diminish regularly to the point, not suddenly swelling and suddenly diminishing, as we often see it in the drawings in print shops, but forming a true conical figure, with the most graceful outline imaginable.

55. Should a stem be cylindrical then it is truly cylindrical, and not deformed by bosses in one place and hollows in another.

56. In branching, every species has its own peculiar arrangement, from which there is no departure. If branches are formed in one way in one part of a plant, they are formed in the same way in all the other parts, so that there can be no truth in figures which represent a plant with branches arranged one way on the right hand, and in some other on the left. In the Sycamore, for instance, the branches are constantly placed right and left, fore and aft, right and left, and so on, appearances to the contrary being owing to accidents — such as the destruction of the buds or rudimentary branches.

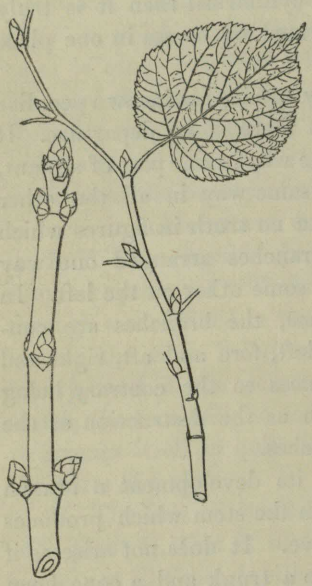
57. In the course of its development a branch never forms an angle with the stem which produces it: it always forms a curve. It does not arise as if a hole had been bored into a trunk and a cone been driven in, but gentle curves of various kinds accompany the separation of the branch from its parent, so that nothing but a curve is allowable when representing the junction of a branch and stem.

58. Even the upper or re-entering angle (or *axil* as botanists term it), is also a curve of some kind, for

there are no angles properly speaking among plants. In branches the curves appear to act as braces or buttresses to keep them steady in their allotted place.

59. Certain curves are however peculiar to certain plants, and their forms require to be accurately shown.

60. Another kind of regular arrangement occurs where branches are not opposite, but placed alternately with each other. Thus, in the common Linden tree, although the branch forms a cone as usual, yet its surface is not represented by a right line, but by a line bending from bud to bud, from right to left and from left to right. Moreover, there is usually a slight convexity at the place on which each bud is seated.



SYCAMORE. LINDEN.

61. It may be that the bends in question are exceedingly slight; they exist, however, and an exact representation of them constitutes one of the differences between the true and the false in drawing. It may be stated as a general fact, that branches with alternate buds have a wavy outline. Truly straight branches are unusual, except when buds are opposite on the same

plane. In such a case, the outline of the branch is formed by a series of long curves placed exactly opposite each other and terminating at the seat of the buds themselves, as if equal antagonistic forces operating on opposite sides took opposite directions in order to neutralise each other.

62. When branches have to be represented in the absence of leaves, it is important to bear in mind that the scars left by the leaves which once existed on them have a definite form. A leaf always has the lower end of its stalk shaped in a well-defined manner, which varies with species. Now, since scars are the spaces left by leaves when they drop off, scars must correspond with the peculiar form of the object which fell away. If we examine the branches of different plants, we scarcely find two species the scars of which are exactly alike; and gardeners and others accustomed to plants know them, although the leaves are absent, by the peculiarity of the branches and their scars. Take the common horse chesnut as an example. In that plant the scars consist of a double curve, resembling a crescent with the horns rounded off. This arises from the base of the leaf-stalk of the horse chesnut having that figure. Such differences are often very remarkable, and a person accustomed to observe correctly would as justly criticise a drawing which, representing a branch, the leaves of which were gone, should show it inaccurately in this respect, as if any other fault, more obvious to untrained eyes, had been committed.

63. This may be familiarly illustrated by a branch of the Fig tree or the Magnolia, in which a careless observer can probably see nothing beyond what may be found on an Elm or a Linden tree. Undoubtedly,

the branches of Magnolias, Elms, and Lindens agree in having alternate buds with a slight scar beneath them; in these respects, a near similarity is at once seen to exist. But in the Magnolia and the Fig tree there is also found a narrow line drawn round the stem from one side of the scar till it reaches the other, giving rise to a peculiar ringed appearance. The rings are caused by a thin membrane, which was originally wrapped round the leaf when young, being there cast off, and thus producing the scars to which reference has been made. These rings are among the most characteristic peculiarities of the plants in which they occur. Their origin should be studied in the Magnolia or Fig tree, by examining them in the young state before the parts fall asunder, or are cast off by the plant in its advancing growth.

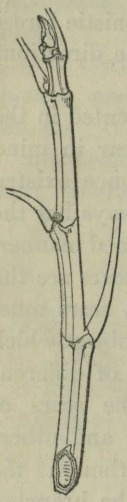


FIG TREE.

64. If it is wished to see how far these principles are observed in practice by manufacturers, it is only necessary to look at some of the "Swiss muslins" employed as window-curtains. (The pattern produced was intended to represent something graceful and natural; but in reality the artist had achieved nothing more than the butt-end of a firelock, a form wholly unknown in nature, and embracing all the faults which the most fertile imagination could impart to a work of art.)

65. In leaves, objects so much more conspicuous than the stem, attracting attention so vividly, and having peculiarities so much more characteristic, the follow-

ing points demand attention in addition to what has been already stated.

66. Leaves require to be considered from different points of view. Firstly, as to the way in which they are inserted into, or, speaking more correctly, grow out of, the stem. Leaves arise from the stem in a manner determinate in each species, so that it is by no means a matter of indifference how the attachment of a leaf is represented, as some appear to think. The stalks, the peculiar forms of which have been already explained, regulate the mode of attachment. In general the stalk of a leaf is furrowed, there being a channel down the middle of at least the lower part of it, but usually extending from one end of the stalk to the other. Where that is the case, it is evidently necessary, in representing a leaf, to show that the two sides of the furrow embrace a portion of the stem from which the stalk proceeds.

67. In another plant the leaves may have round stalks, not channelled ones. In that case they thin away to the right and left in a particular manner, and flatten as they approach the stem. Unless that flattening is observed by the artist, he will not represent the plant before him. Nothing is more important than to observe the various ways in which the leaves of plants are placed in this respect. In the common laurel the stalk is half-cylindrical, with a furrow on the upper side: next the stem it spreads either way, embracing the stem a little, and below is connected with a slight swelling on the stem itself. If this is attended to, the artist may express the truth. If neglected, he will unintentionally represent something else.

68. In certain cases bodies are present at the base

of the leaf-stalk, which are characteristic of particular races of plants. Such bodies (called stipules) in some cases remain, in others fall off early; and always have a definite figure. For example, take a Geranium (*Pelargonium*), a favourite subject with artists. At the base of each of its leaves there is a very small green scale on either side; so that a drawing purporting to be that of a geranium, would not be correct without these scales, because they are indispensable to the species, as an essential part of its structure. All Geraniums have them, and nothing can be allowed to be a representation of that plant from which they are absent.

STIPULES OF PELARGONIUM.

69. With regard to the mode of arrangement of leaves, it is sufficient to say that some are placed opposite others; and, some one above the other, on opposite sides of the stem. Those plants which have their leaves opposite, *always* have them opposite; and those which have their leaves alternate, *always* have them alternate. This is not a matter in which the artist can exercise his caprice; no exigencies of art can justify a departure from this truth, supposing always that it is considered necessary in an artistical point of view to adhere to the truth. Again, leaves, if they are opposite, generally cross each other; that is to say, if we look at the stem from above, the eye rests upon two pairs crossing each other at right angles,

DECUSSATE PIMELEA.

and every other pair stands in the same relative position. From a variety of disturbing causes, however, this fact is overlooked, but it may be generally observed; and this crossing, so apparent in some kinds of plants, is only a representation of the typical manner in which all leaves grow upon a stem. In such a plant as the decussate *Pimelea*, we have this mode of formation shown very plainly, in consequence of the leaves of that plant being stiff, without flexibility and without stalks, so that they cannot be bent out of their places.

70. The mere forms of leaves are infinite, and scarcely require to be dwelt upon, because they readily catch the eye, and are generally tolerably well represented. To one or two circumstances, however, it is material to draw attention. One is the manner in which the edge of a leaf is indented or notched. We all know that leaves are indented in various ways, but it is not a matter of indifference whether they are represented with one form of indentation or another; the truth being, that their edge is always of some peculiar figure in the same species. In one the leaf has notches all round it, appearing as if intended originally to be sharp-pointed, like a saw, but afterwards had the points rounded off. In another plant, each of the principal notches is itself notched in a similar manner, on a smaller scale. Here, again, we see how carefully symmetry is preserved; first we have the general form in itself symmetrical, then each portion is subdivided in the same symmetrical way, from one end to the other; so that, even in so small a matter as the indentations of a leaf, regularity of structure is perfectly maintained.

71. But it is more especially in the veins of leaves

that the characteristic marks of plants are to be found. The veins of leaves are to them what the muscles and veins are to the animal structure. In both cases they are hidden below the surface. We do not actually see them, but we perceive the result of their presence in the elevations, depressions, and undulations of the structure to which they belong. And as we know that in the human figure it is of the first importance to attend to these circumstances, so is it equally necessary in representing plants; for the veins hidden below the leaves have a different management in different species, and that arrangement mainly determines the appearance presented by the leaves to the eye.

72. Generally, the veins are arranged with exact symmetry; they regularly divide into arms, which subdivide into other arms, and eventually lose themselves in minute capillaries, which last produce no particular effect upon the surface. The way in which the veins are arranged is different in different plants, however much they may look like each other, and any substitution of one kind of arrangement for another is fatal to resemblance.

73. For example, take the leaves of the Vine and the Plane tree, in which there is the same general form, so that one might be almost mistaken for the other. The veins of both proceed from the base to the points of the divisions of the leaf. Each division is stiffened by a rib passing from the insertion of the stalk to its point. But some difference in their appearance catches the eye, and gives each a peculiar character, which ren-

VINE LEAF.

ders it impossible to mistake a Plane leaf for a Vine leaf. In what does that difference consist?

PLANE LEAF.

In the Vine each rib has a number of strong curved lateral arms which set off at a particular angle, branching in a peculiar manner, and if not seen nevertheless indicated, by the little variations of light and shade which their innumerable ramifications, and the consequent elevations of surface, produce. Whereas, in the Plane leaf, although we do not find the arms missing, yet they are very much less curved, and the side veins are so sunk in the leaf as to produce little inequality of surface, but to leave the leaf almost flat. Nor is this all. In the Plane the ribs do not quit the stalk as they do in the Vine leaf, and hence again arises a characteristic difference. In the Vine, the principal ribs radiate from a common point, situated exactly where the stalk joins the leaf. In the Plane, the principal ribs spring from a point at a considerable distance above the place where the stalk joins the leaf. Out of this, not to mention other important peculiarities in the veins, grow some of the characteristic features which enable the eye unconsciously to distinguish a Vine leaf from a Plane leaf; and so in other cases.

74. As a general rule, it will be found that the arrangement of veins on one side of a leaf is the same on the opposite side, so that, as was before observed, each side of the leaf balances the other. In reality,

these veins are the passages through which the sap of the plant is conveyed into the leaf. There is a "main" (the mid-rib) along which sap passes, and thence it flows into veins and veinlets to be uniformly distributed. We can easily conceive, looking at the methodical manner in which every thing in nature is arranged, that such ramifications will be placed in the same manner on both sides; the object they have to serve on either side being the same.

SYCAMORE LEAF.

75. Sometimes leaves do not stand precisely in the same position with regard to the stem as in common cases. If we examine a laurel, we find that the leaves are so placed that the planes formed by the upper and lower surfaces are presented, the one to the sky, the other to the ground; and so it generally is. But in some plants it is otherwise, and this difference so affects the whole character of the plant that the distinction becomes of great importance.

76. In certain instances, that of the Iris for example, the edges are turned upwards and downwards, so that the planes of the leaf are at right angles to the earth. This circumstance cannot escape notice in such a plant as an Iris, but it occurs not uncommonly also among trees, when it may be easily overlooked.

77. There is a graceful race of plants inhabiting New Holland, in which every leaf is placed so that

the edge of it is next the stem, and the other edge is turned in the opposite direction. The colonists call them *wattles,* botanists call them Acacias. It will be obvious that, if an artist, neglecting this, were to place the leaves in the common position, he would not represent an Acacia, whatever merit his work might have in other respects.

78. With regard to the mere forms of leaves, these, as has been already observed, are so easily taken in

HORSE CHESNUT LEAF.

by the eye, that it is needless to dwell upon them, beyond one or two small points. Leaves are very often divided in the same manner as in the Horse chesnut, which by the way is a beautiful example of the symmetry of those organs. Such leaves are called digitate, or fingered. Very much like them, yet materially dissimilar, are those of the Christmas rose; for although in the two plants the leaves have the same fingered appearance, yet, in the latter, the fingers at the side are very different in origin from those in the middle; whereas, in the Horse chesnut, they have

all the same form, and all originate in precisely the same manner. In the Christmas rose the side leaflets have branched stalks, but the middle leaflet has an undivided one; so that, while in the one plant the leaflets are placed like the radii of a circle, in the other they spring from a branching base in which little radiation is perceptible.

79. Similar resemblances, yet differences, may be found in the veins themselves, of which the Vine and Plane will be found also to offer a good illustration.

80. It has been already stated that the different sides of leaves are essentially alike, and that we do not usually find leaves with one side different from the other. Hence all those drawings, in which this principle is neglected, may be assumed to be misrepresentations of nature. And yet this truth is forgotten by men of whom something better might be expected. There has been lately published a little work on architectural decoration, in which will be found a drawing of a frieze or moulding covered with the foliage of the Ivy. But the artist does not make the sides of his Ivy leaves correspond. On the contrary, one side of his leaf is twice as large as the other; yet no such leaf as that would be found in the Ivy, unless it were a monster. A similar fault has been committed by the same author in the tracery of foliage proposed for decorating the capital of a column. It is not only doubtful whether the leaves employed all belong to the same plant, as is intended, but the two sides of the leaf will not balance each other, as they ought to do. The result is a one-sided design, of which nature knows nothing.

81. It may, indeed, happen that the symmetry of foliage is in certain cases disturbed by the habitual

production of leaves, one side of which is larger than the other. Such leaves occur in the Elm tree and the Begonia. In both these instances one side is regularly larger than the other, every leaf being necessarily formed upon the same plan in that respect, owing to a peculiar mode of development when very young. But observe how such leaves stand on the stem; the larger side of the leaf is invariably directed away from its branch, and the smaller towards it. This is the case throughout the whole structure,—the larger sides next the eye. It seems as if such leaves were most developed on the side where they are most strongly struck by the light when young. But in these instances there is no irregularity of form, nor any real interference with that symmetry which has been so much insisted upon. If each half of the leaf does not balance the other, at least one half of the plant balances the other half.

82. Examples of drawings, executed in exact conformity to these principles, will be found in such works as the Sikkim Rhododendrons, illustrated by Mr. Fitch; in any of the figures of plants executed by the French artist Riocreux, or in those by the late Ferdinand Bauer, whose Flora Græca, in ten volumes folio, contains 1000 exquisite representations of plants, upon which the scientific botanist in vain attempts to exercise his critical skill. Still finer examples of admirable pictorial talent, combined with great knowledge of the subject, are to be met with in the same artist's unpublished drawings of Passion flowers, preserved in the library of the Horticultural Society. In these drawings every angle, every curve, every elevation or depression, every detail of form or position, all in short that

constitutes truth, and which the eye of an artist can see, is produced with almost the fidelity of a photograph. The result is a surprising degree of resemblance, and consequently of beauty. The botanist imagines that he beholds the living plants themselves, and the mere artist recognises in every detail forms of such exquisite grace as could by no known means have been obtained except by the most skilful application of the laws of symmetry.

LECTURE III.

83. When a plant begins to produce flowers, a great change occurs in its manner of growth, sometimes suddenly, sometimes extended over a considerable time. If the appearance of a flower is sudden, there is little alteration among the leaves antecedent to the appearance of the flower; but when the flowers appear slowly, several intermediate forms have to be noticed before the flower itself. Of this some indication is found in the sweet-scented Colts-foot (*Tussilago fragrans*). The ordinary leaves of this plant are long-stalked, and almost circular, with a heart-shaped base. Such leaves are replaced by degrees by bodies of the same kind as themselves, but of different dimensions and a different form. For instance, shortly above the bottom of the stem, the stalk of the leaf is widened enough to surround the stem completely at the base; but of that circumstance scarcely a trace could be found in the beginning. A succession of similar and gradually increasing differences will be seen to follow, each imperfect leaf becoming more and more unlike the first, till at last we reach the parts among which the flowers are produced. Now, this gradual diminution of magnitude, this change from one condition to another, is extremely common in the branches of plants producing flowers; and all the circumstances belonging to it require to be care-

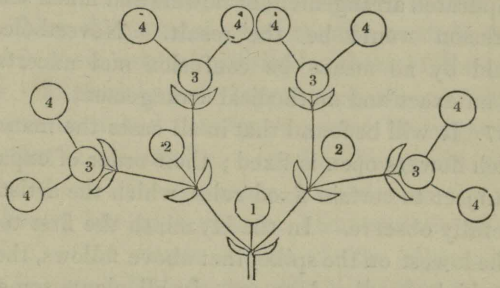
fully observed. It is not allowable to represent these matters, though small, at random, for each is somewhat different from that which preceded it, and the differences may be characteristic of different species.

84. Take any common umbelliferous plant; it will probably be found that the base of the lowest leaf passes completely round the stem; that the next is in the same condition; but that the one which follows does not surround the stem more than halfway; that the next scarcely surrounds it at all; and at last a scale is found fixed to the stem by only a slight point of attachment. Now, this gradual reduction of size and alteration of form, is characteristic of many plants, although it may not occur in others. It must be further remembered that in a structure of this nature, as in leaves themselves, the most exact order is observed in the arrangement and placing of the several parts. It may happen that the flower-leaves now spoken of fall off when young, in which case scars will be left; as happens in the Ivy. The Ivy at one time bears flower-leaves similar to those observed in the sweet-scented Coltsfoot, but much smaller and more fugitive. They fall away early, leaving nothing but scars to indicate their existence. It would therefore be as great an error to represent the Ivy when in full flower, with the small flower-leaves upon it, as it would be to omit them in a case like that of Coltsfoot.

85. The branches on which these flower-leaves grow require to be represented in the same manner as the branches that bear common leaves; and what has been said already respecting the curves — the peculiar flat curves — which are observable in the configuration of branches at the places where the leaves

are set on, applies also here. It is attention to such points that indicates a knowledge of the anatomy of vegetation, exactly as minute accuracy of another kind is evidence of an artist having studied the osteology of the human face. The manner in which the flowering branches are arranged is quite as constant as that of the ordinary branches of a stem. It is not allowable to represent some divisions of the flowering branches one way, and some another, for they have all their own definite form and peculiar distribution.

86. As an instance of this the common Laurustinus may be selected. The natural arrangement of the



LAURUSTINUS.

flowering branches in that plant is of the following nature. There is in the first place a stalk. That stalk is terminated by a flower, which may be numbered 1. At the base of No. 1. grows a pair of small scales, from within each of which shoots forth a curved arm, having at its end another flower (No. 2.), and another pair of scales. The last produce each yet another arm, terminated once more by its flower (No. 3.), and the scales belonging to it; and thus the development proceeds, continually re-

peating itself in the same manner as it began. In this way one number one comes first; a pair of number twos second; four number threes third; eight number fours fourth; and so on. The consequence is, that No. 1., being the oldest flower, opens first. All those numbered 2., being of the same age, and placed in the same position, open next; then follow all the threes, then the fours, and so on, according to their respective ages. If we now suppose that, instead of having one pair of arms terminated each by a flower, we have seven arms radiating from a common point, like the ribs of an umbrella, and each subdivided, on the same principle as the Laurustinus, a still more complicated arrangement of flowers and much seeming confusion would be the result. Nevertheless, it would by no means be confusion and uncertainty, but an exact and methodical arrangement.

87. It will be found that in all cases the manner in which flowers open is fixed; their order of expansion is subject to certain fixed rules, which the artist must carefully observe. In the Hyacinth the first to open is the lowest on the spike, that above follows, then the next higher up, and so on. In all plants something of the same kind is observable; usually the oldest flowers are the lowest and the youngest highest, sometimes the youngest flowers are the lowest and the older ones highest. Be the arrangement what it may, truth demands that arrangement to be carefully observed. Take as an example the Chrysanthemum; in this plant what is called the flower is in reality a considerable collection of flowers, having no stalks, and packed close together upon the flat circular expanded end of a branch, called a receptacle. It is the nature of this plant always to open its

flowers from the circumference of the receptacle towards the centre, and never in any other way; and the same happens in thousands of plants allied to it. In such plants we always find that the first flowers which open are on the outside, and that those in the centre open last. If, then, a drawing should represent the flowers in the centre open, and those at the circumference closed, that drawing would be faulty; it would be untrue to the nature of the Chrysanthemum, and of all plants in which this kind of structure exists. Similar remarks might be made upon all the other modes in which flowers are arranged.

88. Flowers are frequently drawn in the state of a bud. Now the parts of a bud require as much to be placed in their natural position as those of the open flower. If truth is to be represented, the position of the parts in a bud can by no means be neglected. Take that of a Camellia. In this flower the parts are placed one over the other, like tiles on the roof of a house, but in a manner characteristic of the Camellia. One stands outside all the others, then comes another a little larger, within the first, so that we cannot remove the second till the first is taken off. Within the second is another, larger still, and immediately within that, on the opposite side, another; and so on. It is, therefore, obvious that since it is the nature of the Camellia to consist of scales so arranged, that there shall be one outside all the rest, and another within that, but outside the remainder; and since this order is observed throughout, that arrangement requires to be represented as far as the parts are visible to the artist. Other flowers have other arrangements of the parts of the bud, each peculiar to

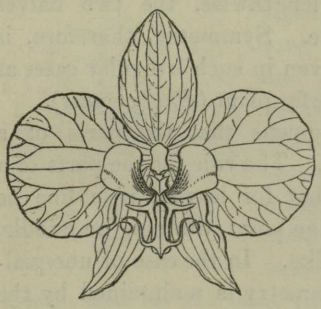
itself. The structure of the flower bud is therefore no less important than that of the expanded flower.

89. Let us next consider what a flower is when looked at in the most general manner possible. A flower is a series of rings, or, as botanists term them, whorls, all placed ring within ring. In a common Crowfoot we have two rings of parts, five green scales in the outside ring, and five petals forming a second ring, within the first. This is a very simple structure; but in whatever degree a flower is complicated, or however numerous its parts may be, they will be found to consist in all cases of rings, one within another, not placed accidentally or with any uncertainty, but always arranged in a manner constant in each species. Take for example the crimson Datura. In that flower there is first an outer portion, or five-angled green body, the angles of which are equidistant, and the interspaces the same, the whole originating from a circle or ring at the end of the stalk, and consisting of five parts, each having a strong rib at its back. The second ring is the coloured part called the corolla, which also consists of five parts. If cut through at the bottom it actually forms a circle. In this case we have two rings, consisting each of the same number of parts. But there is yet another, a third ring, which again consists of five parts, and they too, if traced downwards to their origin, will be found to start from a ring just within the second. Thus we have three rings, that on the outside with strong well marked angles, forming a five-sided figure; the next a tube with five divisions, and then a third with five stamens.

90. This is a very common structure; and equally common is the position in which the parts of each

ring stand with respect to each other. It is by no means a matter of indifference how that is represented. In the Datura the five parts of one ring always stand *between* those of the next ring, and not opposite to them. That is the general rule. When an exception to it occurs, as in a Lysimachia, a Primrose, or similar plant, the circumstance must be carefully noted. It sometimes happens that the number of parts in the rings of a flower does not correspond. There may be, for instance, five parts in the outer ring, and five in the second; and not *five*, but *twice five*, or some other multiple of five, in the third ring; in general, indeed, the numbers are all multiples of each other, so that if you have three or four in one part you have three or four or some multiple of those numbers everywhere else. This is one great cause of the extraordinary symmetry of flowers; and, however it may be hidden, owing to the manner in which flowers sometimes grow, it is always ascertainable.

91. This symmetry of flowers deserves the most careful attention. In some shape or other it is always present. Even the white Butterfly plant, unsymmetrical as it seems to be, is no exception. That singular flower consists of two rings of parts, each made up of three. The second ring not only grows from within, but the parts are placed within each other exactly according to rule. Nevertheless, there is an apparent want of symmetry, for,



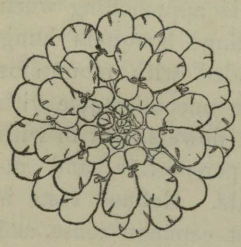
FLOWER OF PHALÆNOPSIS.

although there are three external parts which are all alike, yet the three inner, which alternate with them, differ among themselves. This circumstance is of frequent occurrence; that is to say, although general symmetry is observed, and the number of parts in one ring corresponds with those in another, yet the particular parts may be of unequal magnitude. When that is the case, the necessary equipoise is restored by a corresponding development in the other rings. For instance, if the front of one ring happens to be larger than its back, then in the next ring the back will be larger than the front, and so on; or some similar compensation will be discoverable, and the same mode of adjustment is observable in the two sides of any one separate organ. In the white Butterfly plant, for example, what is called the lip consists of two arms exactly like each other; there is also a halbert-shaped central piece, with the two arms also like each other; the central piece is itself terminated by a pair of tendrils of exactly the same length, the same colour, the same breadth, and alike in all other respects. If divided lengthwise, the two halves would be precisely alike. Symmetry, therefore, is not in any degree lost, even in such irregular cases as that of the White Butterfly plant (*Phalænopsis*).

92. It sometimes happens that the parts of a flower are unequal-sided. The rule for the parts of a flower is the same as that for leaves; if a line be drawn from the base to the point, through the middle, both halves should be alike. In the case of unequal-sided leaves, general symmetry is maintained by the larger and the smaller halves always bearing the same mutual relation to each other throughout the whole plant. The same thing occurs in unequal-sided

petals. Take the Hypericum. In that plant, a line drawn from the base to the point of its petals, through that part which corresponds with the midrib of a leaf, describes a curve, and leaves one half of each petal twice as large as the other. Here, although there is a difference between the magnitude of the two sides of each petal, nevertheless the petals so stand that the general symmetry of the flower is preserved notwithstanding. Should the large side of any one petal be placed on the right hand of the observer, all the other large sides will be on the right hand also, or *vice versa*. The flower of the common Oleander is a favourite object with artists, and in it the very same peculiarity is observable. If neglected, that which is most characteristic of the Oleander flower is omitted, and resemblance fails. Little points of this nature are more common than is imagined, and are overlooked continually in the representation of flowers.

93. Another apparent exception to the law of symmetry occurs in the common Candy-tuft. This flower consists of four petals, two long and broad, two smaller and short. There seems to be no correspondence between the two sides of the flower, and symmetry appears to be missing; but if the general mass of flowers in the Candy-tuft is examined, it will be found that all the large petals are turned with the most exact regularity towards the circumference of the circle formed by the flower-head, and that consequently all the small petals turn towards the centre.



FLOWERS OF CANDY-TUFT.

94. And so it is throughout the endless forms in which the organs of plants vary. Irregularity is always reducible to regularity, and want of symmetry to symmetry, by some plan of compensation, into the exact nature of which it is for the student of art to inquire with all diligence. Such are the fundamental principles by which the artist must be guided, who would pourtray the Vegetable Kingdom as it is presented to us in nature, and who would learn to avoid the manifold errors into which so large a number of flower painters are continually falling.

95. One word more, and I have done. If the principles which these remarks have been intended to explain are important to those who would represent vegetable forms as they are, they have, if possible, a still greater bearing upon those compositions in which plants and their parts are to be employed conventionally. It is to be hoped that the time is approaching when good taste will shrink from huge bouquets hung upon curtains, or carpets loaded with mountains of fruit, or muslin dresses made uncomfortable with eternal garlands of leaves and flowers, put in with a due regard to impossible perspective, and incomprehensible light and shade. Refined taste is shocked at such offences against common sense, and seeks eagerly for that which is beautiful without being ridiculous. Is it not possible that devices of botanists, not intended for decoration, but for the representation of ideal truth, may lend some assistance to the manufacturer? Botanists are accustomed,

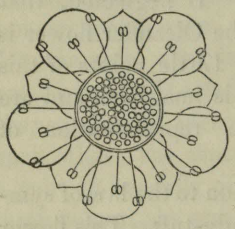


DIAGRAM OF RASPBERRY FLOWER.

for the purposes of abstract science, to project the parts of plants, and especially of flowers or fruit, upon plane surfaces, preserving all the organs in their due position with respect to each other, but neglecting form and other minor attributes. Such projections they call diagrams. Their nature and the mode of constructing them will be best understood by an example; for which purpose the Raspberry flower may be selected. In this flower the centre is occupied by a number of small grains forming a circular heap, each grain having a thread or style proceeding from its end; these would be represented in a diagram by numerous circles, with or without the threads. Next the grains comes a fleshy rim which may be represented by a wavy line. Beyond this stand about twenty stamens, the expression of which would be as many rays, with oblong or globular heads. On the outside of the stamens are placed five petals, imitated by as many curves of any form; and then come five green leaves in two rows, indicated by any five points. This gives a regular figure which represents to the eye of a botanist a Raspberry flower; but, by certain slight alterations of form or proportion in the constituent parts, the same diagram may be made to change its whole aspect without changing its material form; and of these changes I should think that intelligent artists might avail themselves. Some hundreds of thousands, nay millions of variations of this are conceivable, and they seem to answer all the exigencies of manufacturing art.

96. I certainly think that, in this way, much may be done by the taste and skill of those who know how to apply principles to practical purposes. I have

no doubt that if an artist were to take the Victoria Lily, and project all the multifarious parts of it, of different forms, upon a plane surface, and make such changes in it as would be perfectly allowable for such a purpose, consistently with the structure of plants, he would obtain an elaborate pattern, in which taste could find no fault, and in which unintelligent surprise would find much to admire.

97. In conclusion, I would ask you to bear in mind these axioms; that the nearer nature is approached, the nearer we approach to that which is beautiful in form. Of truth, then, the artist must never lose sight; truth must be paramount under all circumstances. But truth may have more meanings than one; we may have absolute truth or conventional truth. Truth, moreover, is not to be confounded with reality. A monster is truth; the most deformed of human beings is a thing which may have existence, but it is not a true representation of what occurs in the human figure; it only represents an exceptional state.

98. In the sense in which truth is used, in questions of art, absolute truth must always be observed in pictorial representation. That I take to be a fundamental principle; for unless minute details are introduced into the delineation of plants, as well as of animals, we may have rude representations indeed, but nothing to satisfy the eye of intelligence.

99. With regard to conventional designs, general truth is quite sufficient; and provided the principle of symmetry, equipoise, and those other circumstances which have been so much dwelt upon in these Lectures, are sufficiently regarded, it matters little in what particular manner the representations of vege-

table forms are given. It is, however, indispensable that the parts should bear a certain relation to each other, and that relation must be what actually exists in nature. Let this be attended to, and it is impossible that any great fault can be committed.

THE END.

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